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WIND RIVER TO MARKET TOOLS AIMED AT COMPETING SYSTEMS

Takeovers shift company's balance of power, usher in age of co-opetition

BY EDWARD J. CORREIA

Embedded RTOS giant Wind River Systems Inc. has unveiled a new development tools strategy for 2001, a plan that conceivably could serve to reduce its own market share of real-time operating systems in the embedded systems market.

Wind River was faced with a dilemma. Following its high-profile acquisitions last year of Integrated Systems Inc., then Wind River's biggest competitor, along with Embedded Support Tools Corp., it had to decide what to do with the development tools inherited from those companies—tools that targeted competing operating systems.

The decision: Continue to sell them, even though the consequences could be a smaller market share for its own market-leading VxWorks and pSOS embedded systems.

According to Geoff Revill, Wind River's director of tools and IDE marketing for its Business Platforms Unit, such fallout from the move should be minimal. "Of course there's a risk there," he said. "But this is a market that is maturing, and as it does, large companies start to realize that co-opetition is a constructive,

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XML Security Spec Solves PKI Interface Dilemma

### Toolkits, coding on the way out as vendors move to standardize XKMS

BY DOUGLAS FINLAY

VeriSign Inc. is moving quickly to get its new XML Key Management Specification (XKMS) into the hands of the W3C for recommendation as a security standard for use with digital signatures and encryption. The security specification, once implemented in vendor products, is expected to substantially reduce the complex coding

and programming now required by developers when adding digital signatures and encryption to documents for use in Public Key Infrastructure (PKI) environments.

"It has been difficult for application vendors to use digital signatures because of the high costs associated with interfacing to PKIs," remarked
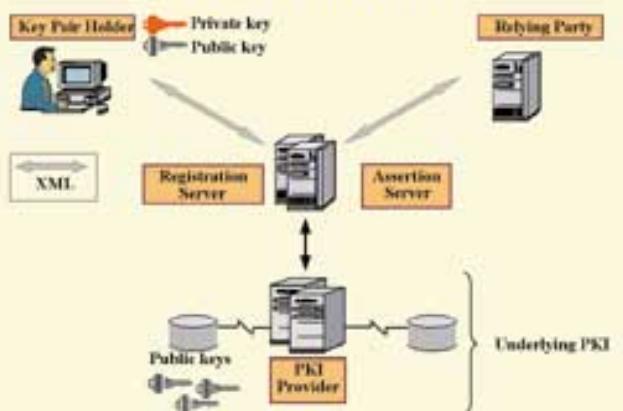
The new security model greatly reduces the need for code.

UDDI's Future Lies in Discovering Web Services

BY DOUGLAS FINLAY

The multivendor Universal Description, Discovery and Integration (UDDI) registry specification is due to go live by March, after entering beta last December. The next step is to make the UDDI registry effective in discovering Web services with the release this summer of version 2, explained Bob Sutor, IBM Corp.'s program director for e-business standards and strategies.

He said that for developing versions 2 and 3, it was of critical importance to have as many software vendor partners involved as possible, citing Oracle's entrance into the membership as a key addition. "With just IBM, Microsoft and Ariba, we could only see it from our perspective." In fact, more than 130 companies now participate in the UDDI project.

Sutor said discovering Web services would necessitate raising the bar on a semantic level. He said that with UDDI utilizing only three taxonomies at present, limiting its reach, the registry needed a more sophisticated replication scheme to copy itself beyond the North American business landscape.

Currently, UDDI uses the North American Industrial Classification Scheme (NAICS) taxonomy for describing what a

business does; the Universal Standard Products and Services Classification (USPSC) taxonomy for describing products and services offered; and a geographical taxonomy for determining where a business is located. "These three taxonomies aren't enough," he said. "We need global relationships now."

He mentioned the Alexandria taxonomy for describing geographical data as one that UDDI vendors were contemplating bringing to provide new industrial classifications on a global scale. But vendors were also debating Microsoft's own geographical data taxonomy, which fits specifically with its

Encarta Encyclopedia software.

Sutor said UDDI needed to go beyond object-oriented classes to provide for Web service discovery. "There are millions of not-so-well-defined classes out there on the Web," he said, adding that it would be incumbent on the UDDI project to solve the problem of organizing those classes to understand the relationships among the services being offered.

He said the ultimate goal of vendors using UDDI would be to build Web service-type applications on top of the registry, so those applications could be exposed to the registry automatically. ∎

Y2K: A LOOK BACK

2000 A LOOK BACK

For IBM, the Internet Becomes the Platform

## Big Blue joins other companies in fostering next-generation applications for the Web

BY DAVID RUBINSTEIN

Think of Web applications as services, not as classic applications. They not only provide functionality directly, but also have the ability to discover other applications, negotiate with them and even complete transactions by themselves, without direct human intervention.

IBM Corp. does. Big Blue, along with other companies, is plotting a course for dynamic integration between applications. IBM plans to release a series of components and product upgrades within the next six months to enable the creation of Web services based on emerging standards and technologies, such as Simple Object Access Protocol (SOAP); Universal Description, Discovery and Integration (UDDI); Web Services Description Language (WSDL); and Extensible Markup Language (XML).

"You need standards or you'll do one-to-one handcrafting [of applications], and that will collapse under the weight of its own cost," said IBM director of e-marketing Scott Hebner.

IBM has made available a technology preview of an application development tool, code-named Lunar, that will integrate with the company's WebSphere application server and take exist-

Service-Oriented Architecture
Web services require standards for publish, find and bind

Service Broker

Partner Globally   Expand Value Net

Publish WSDL   Find UDDI

SOAP
Bind

Service Provider   Service Requester

React Dynamically

IBM's vision of Web services is based on SOAP, UDDI, WSDL and XML.
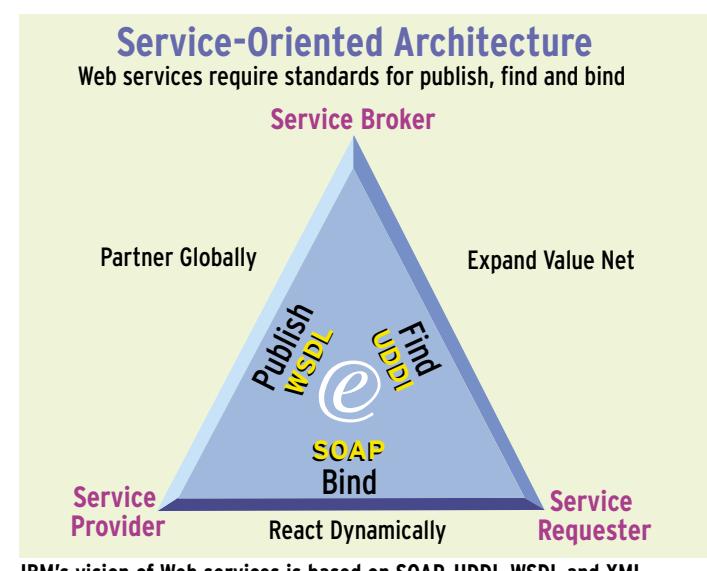
ing Java applications and create WSDL interfaces to turn the applications into Web services, creating a more dynamic way for applications to work with each other. Where SOAP is replacing HTTP as the e-business transmission protocol, Hebner said WSDL will fill the role played by HTML. WSDL, an XML schema being pushed by IBM and Microsoft, provides a standard way for components—or Web services—to describe their capabilities over the Internet.

Hebner said that e-business is undergoing a transformation in which applications will drive Web servers instead of humans,

advertising themselves, finding others with which to transact business, and dynamically integrating to complete transactions. "This will enable the largest portion of e-business to become a reality," he said. "Eighty percent of that opportunity is in the area of B-to-B. It adds a whole new level of sophistication." The Internet today is an information mechanism, Hebner said, which works in a one-on-one business-to-consumer paradigm, whereby a customer visits a business Web site, browses a catalog, fills a shopping cart and checks out his purchase. For businesses trying to deal with multiple trading

partners, this type of customization is a drawback, prompting the push for standard ways of exchanging processes, transactions and data.

A SHARED VISION

Other companies are moving forward with the belief that creating applications using Web-empowered components is the future of application development in the B-to-B space. Last November, Sun's Forte division released Forte for Java as a Web services framework based on XML, UDDI and WSDL. Microsoft's .NET strategy is centered on the idea of turning COM and COM+ objects into Web services, and Rational Software updated its tool suite twice in 2000 with emphasis on application development with the Internet—not an operating system—as the underlying platform.

IBM will roll out this functionality, based on these industry specifications, into its product line during the first half of this year. In late November, IBM released a Web Services Tool Kit on www .alphaworks.ibm.com, and an update includes UDDI4J, a Java-based UDDI server for the new IBM XML and Web Ser-

Applications need to be made Web-savvy from the start, says IBM's Hebner.

vices Development Environment (WSDE), which also is available on the Web site. Also, the Tool Kit now includes a SOAP parser, Hebner said. The WSDE will allow HTML, Java, SQL and XML developers to enable existing applications to deliver data-aware Web services.

Moving forward, IBM will transform some 3,000 Java business components into Web services and release them into UDDI repositories, Hebner said. The company's DB2 database will be outfitted with an XML Extender early next year to be SOAP-compatible, as will Domino. SOAP packages also will be created for its MQSeries message-oriented middleware server, he said. Finally, the Tivoli Web Server Manager will be XML- and SOAP-enabled, and WSDL and UDDI will be added over time.

"We're only four to five years into a 25-year transformation of our economy," Hebner remarked. "The first step was taking existing business processes and capabilities and enabling them for the Internet. Now, we're building Internet-savvy processes from the get-go." ■

XML, Dot-Coms, Microsoft Dominate Headlines

BY ALAN ZEICHICK

The year 2000 came in with a whimper—no crashing airplanes, no massive failures of the power grid—and ended with a peculiar type of bang, as the U.S. election woes turned a few hundred Floridians and a few thousand lawyers into the de facto electors for the next Leader of the Free World.

Outside of the Tallahassee, Fla., and Washington, D.C., courtrooms, life was tamer, but only slightly. For software developers, the world was turned upside down by these top stories of the year:

XML Rules. The Extensible Markup Language came into its own in 2000. Forget about HTML and Web browsers: The name of the game is business-to-business commerce and platform-independent information

exchange using XML schemas. Three years ago, everything had to be Web-enabled; now, it must be able to speak XML. (See "The 'Year of XML' Keeps Going," page 5, for a look at the top XML news stories.)

Bye, Bye, Billions. The second-quarter dot-com crash, coming after the Nasdaq stock exchange passed 5,000 in March, did more than turn a few billionaires into millionaires, and drive a few poorly conceived Web sites out of business. It also made it harder for new ideas to get funding. The plummeting of share prices and the delay of IPOs put stock options under water, making it hard for many companies to attract technical talent. Profits, rather than technology, re-emerged as the best metric for valuing investments. The mood by the end

of 2000 was gloomy on Wall Street and in Silicon Valley.

Whither Microsoft? Well, it's back to lawyers. The antitrust trial ended with judgments against Microsoft Corp., and with a decision to break up the world's largest software company. But as appeals began their lengthy process, there was no certainty as to what changes would occur in Microsoft's business practices. Many would agree that Microsoft's influence appeared to have diminished by the end of the year, but the company still wields incredible market and technological influence—and has massive cash reserves. Although wounded and distracted, Microsoft is still king of the hill.

Nothing But .NET. As if to underscore that point, Microsoft

unveiled its .NET initiative, designed to support true distributed computing over the Internet, enabled by its COM+ distributed component model and middleware, its XML-based BizTalk server and a new programming language, C#. The first parts of the .NET system were released in the fourth quarter, along with betas of a few development tools. The importance of .NET, and whether it will allow Microsoft to dominate the business-to-business Internet, remains to be seen.

Wireless: The Next XML. Software tools vendors and enterprises alike went gaga over the Wireless Access Protocol, seeing the mobile-commerce market as the next great opportunity, and many application-

server vendors repositioned their companies to bet the business on WAP. Early reports from customers about poor quality of service, however, led some analysts to wonder if this huge untamed beast is actually a white elephant. On the other hand, Bluetooth, a short-range wireless specification for embedded devices, achieved widespread industry support.

UML Is the Best Model. This past year saw a proliferation of new Unified Modeling Language-based design, analysis and coding tools. A drive to formal modeling has been a long time coming, but given the complexity of modern software engineering, the increased cost of hiring developers and the new business imperatives for delivering software on time, there's no doubt that modeling is here to stay. ■

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Cobalt Opens Up the Qube

New Sausalito APIs, developer programs enhance server platform

BY ALAN ZEICHICK

Long known as the maker of small-business server appliances, Cobalt Networks Inc. has opened up its new Qube 3 for third-party developers with a new software architecture and developer-support program.

The Qube 3 (www.cobalt.com/products/qube) is an *x*86-based server, in the shape of small blue cube, that runs Red Hat Linux 6.2 as its operating system, and also includes Send-Mail, the InterBase 6 SQL database and Apache Web server with the ability to execute Perl and PHP server-side scripts. In addition, the Qube includes ChiliSoft's Active Server Pages runtime for Linux. Cobalt purchased ChiliSoft in March 2000.

There are three models of the Qube, ranging in price from $999 for a 300MHz model with 32MB RAM and a 10GB hard disk, to $1,999 for the top-of-the-line Professional Qube with a 450MHz Pentium III processor, 128MB RAM and two 20GB hard drives.

Cobalt's new software interface, called Sausalito, provides a set of unified APIs to help developers access the Qube's built-in applications and functionality, such as Apache and its Lightweight Directory Access Protocol (LDAP) server. The Sausalito APIs also give developers the ability to modify the Qube 3's Web-based user interface or integrate new applications with the Qube's look and feel.

The Cobalt developers' network (http://developer.cobalt.com) is a no-cost program that offers API documentation and technical notes for the Qube 3 and Sausalito.

Cobalt's third-party developers can also take advantage of the company's BlueLinq service, which is a software marketing, package distribution and upgrading system akin to Microsoft's Windows Update. Software built into each Qube can monitor applications stored on

Cobalt's BlueLinq servers and notify systems administrators of updates to installed applications, and optionally download and install those updates automatically. BlueLinq will also act as a marketing channel for ISVs and service providers.

In September 2000, Sun Microsystems Inc. agreed to acquire Cobalt in an all-stock deal for approximately $2 billion. The acquisition was completed in late December. ∎

Qube Web servers include pre-integrated software.

Qube 3 for Developers
Leveraging BlueLinQ™
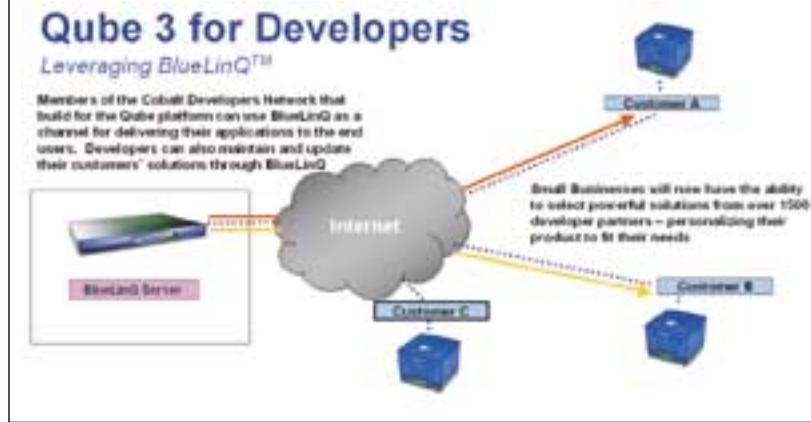
Cobalt's BlueLinq service is akin to Microsoft's Windows Update.

EBXML PROOF-OF-CONCEPT SPECS FINISHED EARLY

BY DOUGLAS FINLAY

The large-scale ebXML proof-of-concept demonstration last month included three of five specifications the consortium identified as essential requirements for businesses to work both openly and globally in the near future on the Internet. The specs will be available to the public in March, two months earlier than the original 18-month development deadline.

Not only did the demonstration prove the XML/MIME transport package was working among several vendors during the tests, it also featured the registry and repository specification, the trading partners agreement specification—both necessary to provide businesses with the ability to "discover" one another through the repository specification—and the transport, routing and packaging specification.

"The registry and repository specification is a holding area that holds information about business partners, with business process models, vocabularies and semantics of documents," said Ed Julson, Sun Microsystems Inc.'s manager of XML marketing.

He said that with the registry and repository storing information relevant to transactions businesses want to make, drilling down to the trading partners agreement specification would enable businesses to define how they want to do business with a partner, such as what particular set of XML documents would be exchanged to conduct business. Once that determination had been made, the transport, routing and packaging specification would be used for communication between them over XML/MIME.

"But this isn't a framework in the monolithic sense," Julson continued. "It is a modular, integrated design." Because each specification is not dependent upon the other, businesses could use just one of the specifications rather than rely on all of them.

Julson said the specifications would be ready for release in March in part because the consortium used available technologies and applied them where they would work. "There is a lot of good work out there that just needed to be tailored to meet the needs of XML."

Only the business processes specification and the core components specification are left to be completed, and will be out by May, he said. ∎

The 'Year of XML' Keeps Going

BY DOUGLAS FINLAY

The year 2000 was not the year of XML. It actually began in 1998, extended into 1999 and went full throttle into 2000 and beyond, said Bob Sutor, IBM Corp.'s program director for e-business standards and strategies.

"In 1998, with the emergence of XML, the industry asked: What is XML? Is it a protocol we can use for business or for publishing? Then, in 1999 the industry realized it could use XML for messaging," Sutor continued, "and use XML in place of EDI [Electronic Data Interchange] to lower costs."

He said 2000 would be known as the year for building infrastructure based on XML, and writing standards for it. "The industry worked to determine what message envelopes would look like, and to address security and reliability measures," he said.

Chief among those standards-writing activities in 2000 was the ebXML Initiative, sponsored in part by the Organization for Advancement of Structured Information Standards (OASIS), which developed an XML message transport protocol based on XML headers that included a MIME package for unstructured data to help businesses that had invested hundreds of thousands—if not millions—of dollars in EDI to maintain their investments.

There was reason to believe the ebXML consortium would implement the new XML specification called SOAP (Simple Object Access Protocol), written by Microsoft Corp., because it was written precisely for transporting structured XML data. But Ric Drummond, team leader of ebXML's transport group, discarded SOAP 1.0 as not robust enough for the work its XML specification needed to do, which was transport unstructured data.

Soon after, SOAP 1.1 emerged from a generous re-working by IBM, Lotus Development Corp., Microsoft and others, which provided for techniques to include unstructured data and varied file formats in the XML message. In addition, SOAP 1.1 now enabled messages to run over SMTP as well as HTTP. SOAP also moved into the W3C working group to compete with WebBroker and XML/RPC to become the standard XML transport protocol.

The Extensible Stylesheet Language Transformation (XSLT) garnered much attention as several companies added XSLT to their product lineups. Besides providing the obvious conversion of XML to HTML for presentation on Web sites, XSLT began to map various XML vocabularies such as cXML, FpXML, xCBL and XBRL from vertical industries to one another to cut developer costs in writing sophisticated conversion programs.

XML also found its way into mainstream databases in 2000, as IBM's DB2 7.1, Microsoft's SQL Server 2000 and Oracle's 8i databases added or enhanced their XML support. But Software AG USA went one better and built a native XML database server, enabling data to be received and deployed regardless of the operating system. Percussion Software Inc. built a content management tool to complement these XML servers.

By focusing on native XML data, these servers could receive data in any format, and transform it into any other format for use anywhere on a network or on the Web. Microsoft's BizTalk Server, part of the company's .NET product strategy, also laid claim to being able to integrate data from any source into any other data source utilizing XML. Developers could, in fact, now concentrate on business logic and applications themselves, rather than write conversion programs to solve myriad formatting bottlenecks. ∎

XML • 2000 — A LOOK BACK

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Community Pries Open Sun's Specs
Revamped JCP among top Java developments

BY DAVID RUBINSTEIN

The will of the people shall not be denied. It's written into the Declaration of Independence—in much more compelling prose—and now it's written into the Java Community Process (JCP).

Reacting to pressure from its licensees and partners, Sun Microsystems Inc. this year opened up the Java specification to input and review from elected committees culled from the user community. Originally submitted to and then withdrawn from the ECMA standards body, Sun's proprietary spec was literally pried open by the disgruntled masses looking for a standard on which to base their enterprisewide systems, and by the third-party vendors seeking to speed the specification's evolution and add value to it.

"They've made a lot of strides in opening Java up," said Madison Cloutier, vice president of marketing at Tower Technology Corp., maker of the TowerJ virtual machine and the first alternative Java Virtual Machine (JVM) provider to be issued a J2EE license. "End users and ISVs look at it as an open standard. You might still hear flak from the OEM community, but in the minds of the ISVs, it's standard enough for them."

Issues of licensing and branding still remain, as do questions surrounding intellectual property rights—those assets that make the specification more robust that are developed by third parties and integrated by Sun back into the specification.

All that notwithstanding, the year saw a huge proliferation in the number of application servers based on the J2EE specification. No less than 20 players are vying in an incredibly competitive market, each looking to set itself apart by extending its core competencies into areas it hopes will garner it more customers. A sure sign that Java is being widely adopted in the industry is the tremendous number of attendees to the JavaOne show in San Francisco in June and the Embedded Systems Conference in San Jose, Calif., in October.

Meanwhile, the JCP is reviewing version 1.3 of the J2EE specification, with a requirement that a Java Message Service implementation be included for any product looking for Sun's seal of compliance plus a two-phase commit in the transaction implementation. J2EE 1.3 also requires a Java for XML Processing (JAXP) 1.1 API that must support SAX and DOM Level 2. Connectors, the other major change to the spec, will

allow a J2EE application server to communicate with and integrate with applications outside the J2EE system, such as legacy and ERP applications.

The Java 2 Standard Edition also was revved up this year, with an optimized HotSpot virtual machine from Sun and pared-down libraries and foundation classes for increased performance. And a Micro Edition of Java 2 was released this year, an optimized runtime targeted at application and embedded systems developers for consumer-oriented appliances. J2ME includes the CLDC application foundation based on the mini-JVM called KVM. A Mobile Information Device Profile (MIDP) allows small devices to download applications and services across a network, and run them while disconnected from a wired or wireless network.

Java WebStart software was unveiled this year, which Sun claims simplifies the process of deploying Web-based Java applications. Sun said any Java 2 application can be started from any browser, and eliminates compatibility issues by ensuring that the correct JVM and support software are downloaded to execute the application.

And in the spirit of openness, Sun released the J2SE and J2EE specifications on Linux. Power to the people! Right on! ∎

VSLIVE HITS SAN FRANCISCO

BY ALAN ZEICHICK

One of the first educational events of the new year for developers of Microsoft Visual Studio, SQL Server and Exchange applications will be Fawcette Technical Publications Inc.'s VSLive conference, scheduled for Jan. 13 to Jan. 20 in San Francisco. As with last year's VSLive show, this conference combines four smaller conferences into one venue: the flagship VBITS event for Visual Basic programmers, the Visual C++ Developers Conference, SQL2TheMax and Exchange Developers Summit.

The conference starts with nine full-day technical workshops on Jan. 13 to Jan. 15. The first day features beginner and expert workshops on XML and

SOAP, plus a session on ASP+. On Jan. 14, full-day sessions address using Visual Basic data access services, Web-site development and C# language frameworks. The final set of workshops covers object-oriented programming concepts for Visual Basic developers, the design of distributed systems with Visual Basic, and ASP+ for C++ programmers.

Beyond the full-day workshops, there are approximately 200 technical sessions at VSLive. The event's exhibit hall is open from Jan. 16 to Jan. 18 as well.

On Jan. 16, Microsoft will be keynoting the start of VSLive with a special presentation on its .NET initiative, followed by a full day of .NET classes by Microsoft trainers. ∎

News Briefs

COMPANIES

NeoCore LLC's agreement with **X-Aware Inc.** enables Neocore's XML Commerce Server to seamlessly integrate data from traditional databases with XML and vice versa, permitting customers to exchange data from both sources in real time . . . **Cape Clear Software Ltd.**'s acquisition of **Orbware Ltd.** helps Cape Clear extend its CapeConnect product line to include Orbware's high-performance OrCAS implementation of J2EE. Integration of OrCAS will further provide Cape Clear developers with XML access to Java back ends . . . **Rational Software Corp.** has agreed to purchase the remaining shares of **Catapulse Inc.** that it didn't already own for $405 million. The deal is expected to be finalized in March. Catapulse offers a hosted development service that now will be integrated with the Rational Suite of development tools . . . **Jubilee Tech International Inc.** will add **Percussion Software Inc.**'s Rhythmyx XML Content Manager to its own Web Globalizer service, enabling its customers to integrate total content management and e-commerce components into their global sites. Web Globalizer provides simultaneous global delivery and management of localized Web content . . . **The Chemical Industry Data Exchange** has voted to expand its mission to be the chemical industry's XML standards keeper. Its new standards are posted on its Web site (www.cidx.org) . . . **Sun Microsystems Inc.** and **iPlanet E-Commerce Solutions** have acquired **Grapevine Technologies**, to include the company's collaborative knowledge management software for enterprise-class search and indexing capabilities into the Sun-Netscape Alliance's iPlanet Portal Server . . . **TogetherSoft Corp.**'s Together Control Center is now available on **Iona Technologies Inc.**'s iPortal Application Server. The companies claim that the Control Center will enable iPortal customers to deploy new J2EE applications and facilitate quicker communication between enterprise legacy systems and Internet-based applications . . . **XML Global Technologies Inc.** has signed a letter of intent to acquire **Bluestream Database Software Corp.**, to combine Global's GoXML search engine and EDI/XML transformation software with Bluestream's native XML database technology and provide XML Global customers with a fully integrated XML platform . . . **SilverStream Software Inc.**'s acquisition of **Bondi Software Inc.** will enable SilverStream to utilize Bondi's strength in cross-platform delivery. Also, SilverStream announced its eBusiness platform has passed Sun's J2EE certification test suite . . . Anticipating the release of **Apple Computer Inc.**'s MacOS X, currently in public beta, **Aladdin Systems Inc.** has released a version of StuffIt Install-Maker to support that operating system . . . **Progress Software Corp.** will release the source code of its Application Development Environment under an open-source licensing model. Through its Progress Open Source Software Exchange (POSSE), the company and its development community can collaborate on new application-development tools. Developers can register at www.possenet.org . . . **Microsoft Corp.** is previewing XML as database-access technology for data analysis programs needing access to SQL Server 7 and SQL Server 2000 databases. A draft of its XML for Analysis specification is available for public comment at www.microsoft.com/data; the spec may ultimately replace OLE DB (Object Linking and Embedding for Databases) for Web-based OLAP and data-mining applications. An updated specification is expected by Jan. 30.

PRODUCTS

Thinairapps Inc.'s **ThinAir Server 1.2** gives developers the ability to access Microsoft Exchange and Lotus Domino groupware data, including e-mail, calendars and address books, from Palm, PocketPC, RIM or Symbian mobile devices. Prices start at $1,000 for a 10-user license. A free evaluation is available from the company's Web site (www.thinairapps.com) . . . The **Linux 2.4** kernel was released last month, which includes enhanced support for symmetric multiprocessing, USB support, a rewritten networking layer and its most important feature: greater scalability. Caldera Systems Inc., Red Hat Inc., TurboLinux Inc. and SuSE Inc. already

POWERSTEERING UNVEILS WORK-MANAGEMENT TOOL

BY DAVID RUBINSTEIN

It's both a tool for managing distributed development projects, and project management software suitable for including in broader applications. PowerSteering Software Inc. is touting both those benefits of its new Workserver project-management application.

"There are hundreds of companies that offer some level of collaborative project management that they build from scratch," said Andy Singleton, CEO of PowerSteering (www .psteering.com), which changed its name from Cambridge Inter-active last October. "That's our target. People shouldn't be doing this from scratch."

Workserver, Singleton said, was built with a standard three-tiered architecture—a presenta-tion layer with Java Server Pages, a business-object layer of Java classes running within a Java application server, and a relation-al database layer. Workserver includes a server-side Java appli-cation called PowerSteering 3.0 that is designed for managing projects over the Web. It also comes with an SDK, made avail-able last month, to allow devel-opers to customize and extend Workserver by offering access to a small-footprint development environment running inside IBM's VisualAge for Java. The price for Workserver is $200 per user per year but can be reduced by higher volume. The cost includes unlimited up-grades and e-mail and phone support, Singleton said. ∎

BEA Releases WebLogic 6.0

WebLogic 6.0, BEA Systems Inc.'s J2EE-certified application server, has come out of beta and enters general release this week with an emphasis on the capabil-ities provided by its Java Message Service (JMS) implementation.

The key differentiator, ex-plained BEA's (www.bea.com) WebLogic product manager John Kiger, is that WebLogic 6.0 is the first application server to combine a full implementation of JMS with the message-driven beans described in the forthcom-ing EJB 2.0 specification.

"We now have all the pieces to look at an application server as a bigger platform," Kiger said.

Other improvements to the application server include a Web-based management con-sole based on the Java Manage-ment Extension (JMX) frame-work, enhancements to its XML capabilities, as well as a perfor-mance increase.

THIRD PARTIES SUPPORT 6.0
Two companies—TogetherSoft Corp. and Neon Systems Inc.—have already released products to integrate with the new release of the WebLogic server.

TogetherSoft (www.together soft.com) has released beta code for a WebLogic 6 building block, which it said lets devel-opers use TogetherSoft Control Center to build and deploy applications onto the server.

Neon (www.neonsys.com) is offering its iWave J2EE-compli-ant JDBC driver, which it said will let WebLogic 6.0 access information on OS/390 main-frames. According to Neon, competing JDBC drivers for the mainframe provide support only for DB2; iWave also com-municates with OS/390-based ADABAS, CICS, IMS/DB and VSAM data sources.

—David Rubinstein

Search Repositories? Go Ask Alice

i4i turns Word into an XML browser for text interaction

BY DOUGLAS FINLAY

Extending the value proposition of its S4/Text utility, which plugs into Microsoft's Word software, Infrastructures for Information Inc. (i4i) released a beta version of its S4/Enterprise XML middleware program, code-named Alice, for content developers that turns Word into a browser to search internal and external text repositories such as Lotus' Notes, FileNet's Panagon and spreadsheets.

When Alice extracts data from corporate repositories it is authorized to access, it takes the data and transforms—or normalizes—it into an XML construct at the middleware level. Once the construct is completed, it is placed back in the repository as XML data. It can then be retrieved for manipulation by content developers for use in any text document for just-in-time publishing.

"With a key issue for content developers being how to use content to build the knowledge base and update it appropriately, Alice provides browser interaction capabilities to access text repositories to capture the XML data and create that knowledge base, and constantly update it within documents and the Web," said Michel Vulpe,

chief technology officer and co-founder of i4i (www.i4i.com).

He said that Alice works transparently for content users in capturing the XML data at the middleware level, with no user action required. Customized Word templates for XML then eliminate tags as users create documents, utilizing data they

have captured from the repositories, turning them into content creators who can post to the Web via the XML browser capability, as required by deadlines. He said Alice builds hyperlinks and protected links, as well as targets.

Vulpe said Alice "eliminates the need for developers to write programs to extract stuff and to

transport stuff," such as metadata extraction code, transport service code and message handling, and concentrate instead on the business logic and feature richness of applications they work on.

Alice, which has been in development for a year, will be available May 1. Pricing has not yet been determined. ∎

SERENA DEVELOPS TEST, DEBUG TOOL

Serena Software Inc. has announced a rapid application testing and debugging tool, StarTest, which the company claims allows developers to test and debug applications while they are being executed.

StarTest provides a way for application developers to insert breakpoints with different values, and then view the program while it is running so changes can be made until the application delivers exactly the functionality that is required, the company (www.serena.com) said in an announcement.

The tool is being incorporated into Serena's StarSuite, a group of products for file and data management, fault diagnostics, application performance monitoring and testing and debugging. StarTest is expected to be generally available this month. ∎

OPEN MOTIF MAKES JUMP TO ITANIUM

BY EDWARD J. CORREIA

For developers looking for a way to port Motif-based applications to Intel's 64-bit processor, help is on the way.

Open-source developer Integrated Computer Solutions Inc. (ICS) has teamed up with TurboLinux Inc. to announce the availability of Open Motif for Linux running on Itanium, Intel's forthcoming 64-bit processor.

The GUI toolkit adds to a growing list of developers' tools that have been released in recent months, despite the scarcity of the processor itself, and of systems based on it. Intel in November released new C++ and FORTRAN compilers for Windows designed for use on Itanium and for its upcoming 32-bit Pentium 4 processor. When the company began shipping Itanium-based prototype systems in December 1999, it said that quantity shipments of the new high-end chip were scheduled for the second half of 2000. Intel now says it will release the processor sometime in the first half of 2001.

An abundance of tools means Linux developers with 32-bit applications can hit the ground running. "We see this step as critical for ISVs in making their applications available on Intel's next-generation systems," said Jerry Greenberg, senior vice president of marketing for TurboLinux (www.turbolinux.com), adding that nearly all enterprise applications currently running under Unix rely on Motif.

Open Motif for Itanium processors running Linux is an open-source project and is available now for free download at the ICS Motif portal site www.motifzone.net. ∎

Solaris Opened In Limited Way

BY ALAN ZEICHICK

Under a new "Solaris 8 Foundation Source" program, Sun Microsystems Inc. is releasing the source code to its flagship operating system, free of charge, for developers, enthusiasts and students to study. But don't mistake this program's intent: Far from presenting the company's crown jewels to the open-source community, Sun's license agreement for the Source Foundation presents a very restrictive policy that prohibits redistribution of the source code or the compiled binaries based on that source code to anyone else, even within the same business or school.

The name of the game: compatibility. "Allowing access to the source code will ensure those interested in the operating environment an easy method of understanding it and thus being able to deliver compatibility," said Andy Ingram, Sun's vice president for Solaris, in a statement.

Parties interested in downloading the source must first fill out a form and license agreement and fax it to Sun, which will send back authorization codes for the 183MB download. Alternatively, for a $75 fee the company will mail CD-ROMs containing the source code, compiled binaries for SPARC and *x*86 processors, and a trial version of Sun's Visual Workshop C++ compiler. Participants in the program can also take part in a closed discussion forum on Sun's Web site. The only support for this program comes through the online forum.

Sun's information about the program is at www.sun.com/solaris/source. ∎

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Tower Tackles Performance Issues

BY DAVID RUBINSTEIN

NEW YORK — A new Java application performance analyzer was among four new developments announced by Tower Technology Inc. at the eBusiness Conference and Expo held last month at the Jacob. K. Javits Convention Center.

The performance analysis tool—the name of which is the subject of an ongoing internal debate—evolved from internal testing, according to Tower's marketing director Madison Cloutier. "We were trying to understand why we weren't getting across-the-board performance improvements" for all applications, he said. So hooks were added for Tower's professional services team to better identify design-induced execution patterns within the applications.

The problem with many profilers on the market today, Cloutier said, is that they often don't drill down deep enough for development teams to be able to identify performance snafus. "So, they try something to fix it, and it doesn't work, and they try something else, and they get caught up in a labor-intensive, costly cycle" that seldom results in optimization, he said.

According to Cloutier, the unique features of Tower's performance analyzer include the ability to trace when exceptions are thrown, detailed analyses of thread activity and status, and a view of system handles and file descriptor activities.

When run as a complementary tool to the TowerJ Java Virtual Machine, the analyzer provides application analysis at high speeds. "It's like a car," Cloutier explained. "A tire could be loose, but you won't know that driving five miles an hour down a local street. But when you get out on the highway, the car will shimmy." Most profiling tools use the standard JMPI interface that carries a lot of overhead and slows performance, Cloutier said.

Among the other product upgrades is the release of TowerJ 3.6, which now includes support for Sun's J2EE 1.3 specification, improved performance by as much as 30 percent based on internal testing, and ease-of-use capabilities for companies looking to replace existing JVMs with TowerJ. Cloutier said the new version significantly reduces CPU utilization. "A server eating up 70 percent of CPU can blow up with a spike in traffic," he said. "With TowerJ, now perhaps the server only is at 35 percent utilization, which leaves lots of power left to handle spikes or add functionality." This is accomplished, he explained, by an "ahead-of-time" compiler that does much of the work offline, and does not waste CPU cycles the way just-in-time compiling does, he said.

At the eBusiness Conference, Tower (www.towertech.com) demonstrated a version of TowerJ for Intel's new Itanium processor. "We're running the first stack with TurboLinux on IA64," he said of the version that should be generally available in the next few months. He said TurboLinux was chosen because Tower's engineers found it to be the most stable operating system on the Itanium servers. TowerJ, he said, is available on eight platforms, including AIX, HP-UX, Linux, Solaris, Tru64 and Windows NT/2000.

Tower also announced a partnership with the Washington, D.C.-based consulting firm Adrenaline Group. ∎

Linux Leads as Enterprise Embraces Open Source

Programs earn respect for cost savings, hardware independence and easy implementation

**BY EDWARD J. CORREIA
AND DOUGLAS FINLAY**

The year 2000 witnessed corporations opening up more to the open-source community, in search of programs that run independently of hardware configurations and are cheaper to implement than custom programs developed from scratch. Yet, as open-source enthusiasts spoke of cheaper costs and hardware independence associated with using open source, other voices cautioned that open-source programs would not always provide a competitive advantage.

Yet some of last year's most sought-after initial public offerings were those of Linux companies. In some cases, those hot offerings ultimately fizzled. Consider VA Linux Systems Inc., which saw its stock soar to $320 only to drop into the single-digit tank, where it currently swims with Caldera Systems Inc. and Red Hat Inc.

Share prices notwithstanding, the Linux operating system continues to gain acceptance. According to the research firm Netcraft, Linux is in use on about 60 percent of today's publicly accessible Web sites. Windows NT, its nearest competitor, is used on about 20 percent.

Some of the most frustrating news for Linux developers came from Borland Software Corp. (which spent most of the year being called Inprise Corp.). Borland promised that its much-hyped C++ Builder for Linux would be ready this year but failed to deliver. Codenamed Kylix, the long-awaited integrated development environment has been in beta testing since June 2000.

If you can't get to Delphi, perhaps an oracle will do. Oracle Corp., maker of the world's most popular database for the Web, released Oracle8i Release 2 for Linux, which added support for Java 2, XML and for the Oracle XML Parser for Java. Since its release in March, the free database (http://technet.oracle.com) has been updated to Release 3, which now includes enhanced XML support, new security features, a PL/SQL Gateway for HTTP and additional Java services.

Year 2000 also saw IBM Corp. go heavy into Linux. The company, which developed a set of extensions to permit Linux to be run on its System/390 mainframes, signed deals with Turbo-Linux, SuSE, Red Hat and Caldera to include the extensions with their Linux distributions.

Linux also is finding its way into small iron, perhaps literally. As the embedded market explodes (see "A Great Time for Embedded," page 19), vendors and customers are lured to royalty-free Linux as an embedded operating system and application development platform. The year has seen the release of devices based on Linux ranging from server appliances to digital cameras.

Meanwhile, the Perl 6 rewrite edged closer to reality. Although there are still enough conflicting reports from the far edges of the industry to keep pundits from declaring whether it will be written in C++ or C—and chief architect Larry Wall himself appeared uncertain at one point—Wall did hand over much of the design work to the open community to form committees to determine the direction and inclusions of the rewrite.

The Mozilla organization released Netscape 6 but saw both fanfare and skepticism. Fanfare because it was the first open working of the world's most famous browser; and skepticism because, in adding some great features, it forgot to screw back in many of the old, good ones.

Apple Computer Inc., Be Inc. and BSD Inc. released portions of their operating systems to the open-source community, as much a means to garner creative input and create a user base as to gain market share as more commercially acceptable and alternative operating systems to Linux.

Sun Microsystems Inc., not to be undermined by other positive open-source announcements, opened up its StarOffice office suite. Although it's widely felt that StarOffice still lags behind Microsoft Corp.'s Office suite in functionality and user interface, StarOffice nonetheless became the open community's most ambitious and visible prize.

Finally, XML taxonomies and schemas—as well as Document Type Definitions—have increasingly been made available to the open-source community in the form of repositories at BizTalk.org, ebXML.org, OASIS.org and XML.org, giving developers an opportunity to find appropriate schemas to fit into projects. Indeed, continual use of a popular schema found within a repository has the potential to lead to its standardization, Microsoft's David Turner, product manager of XML technologies, has said. ∎
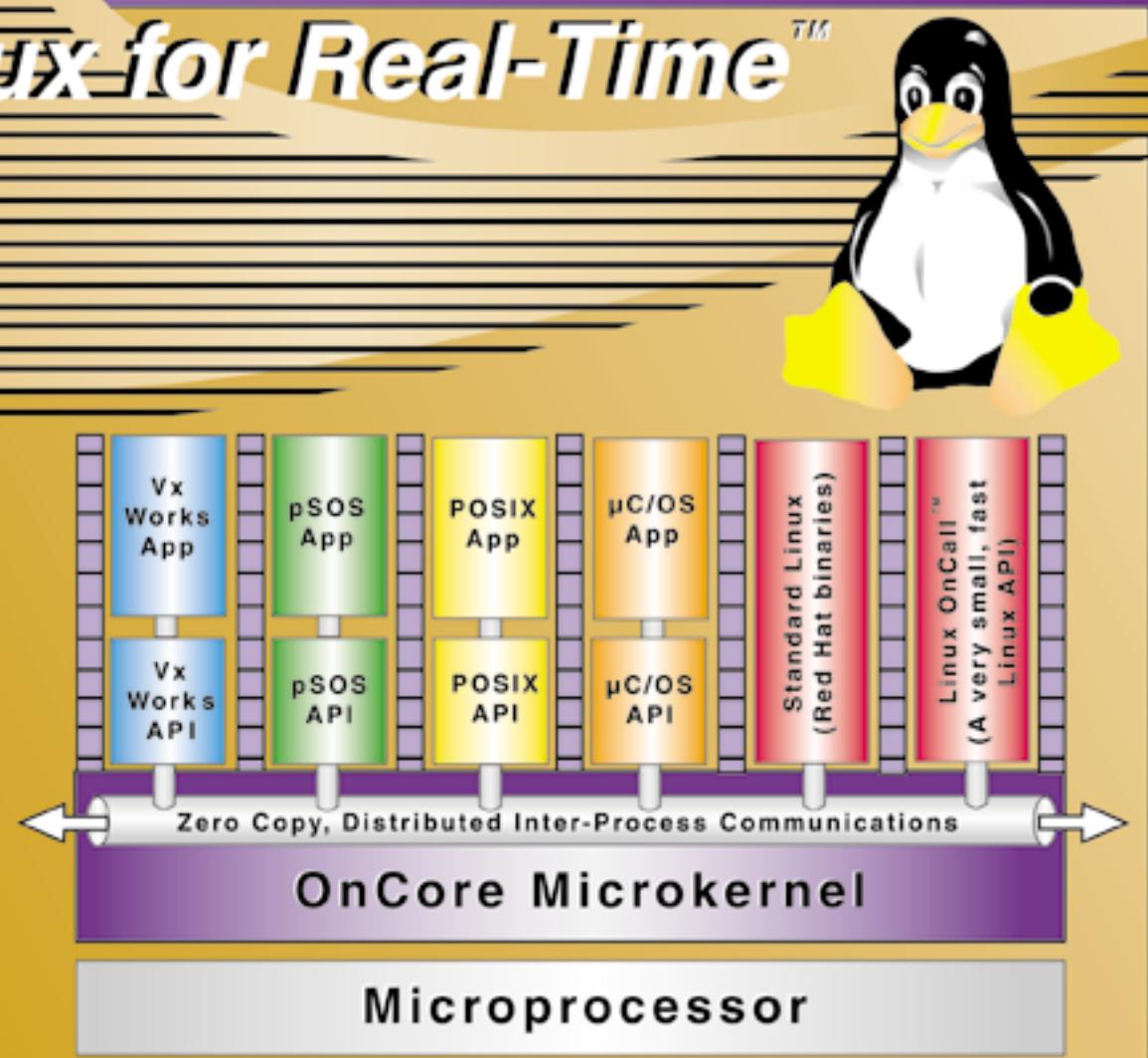
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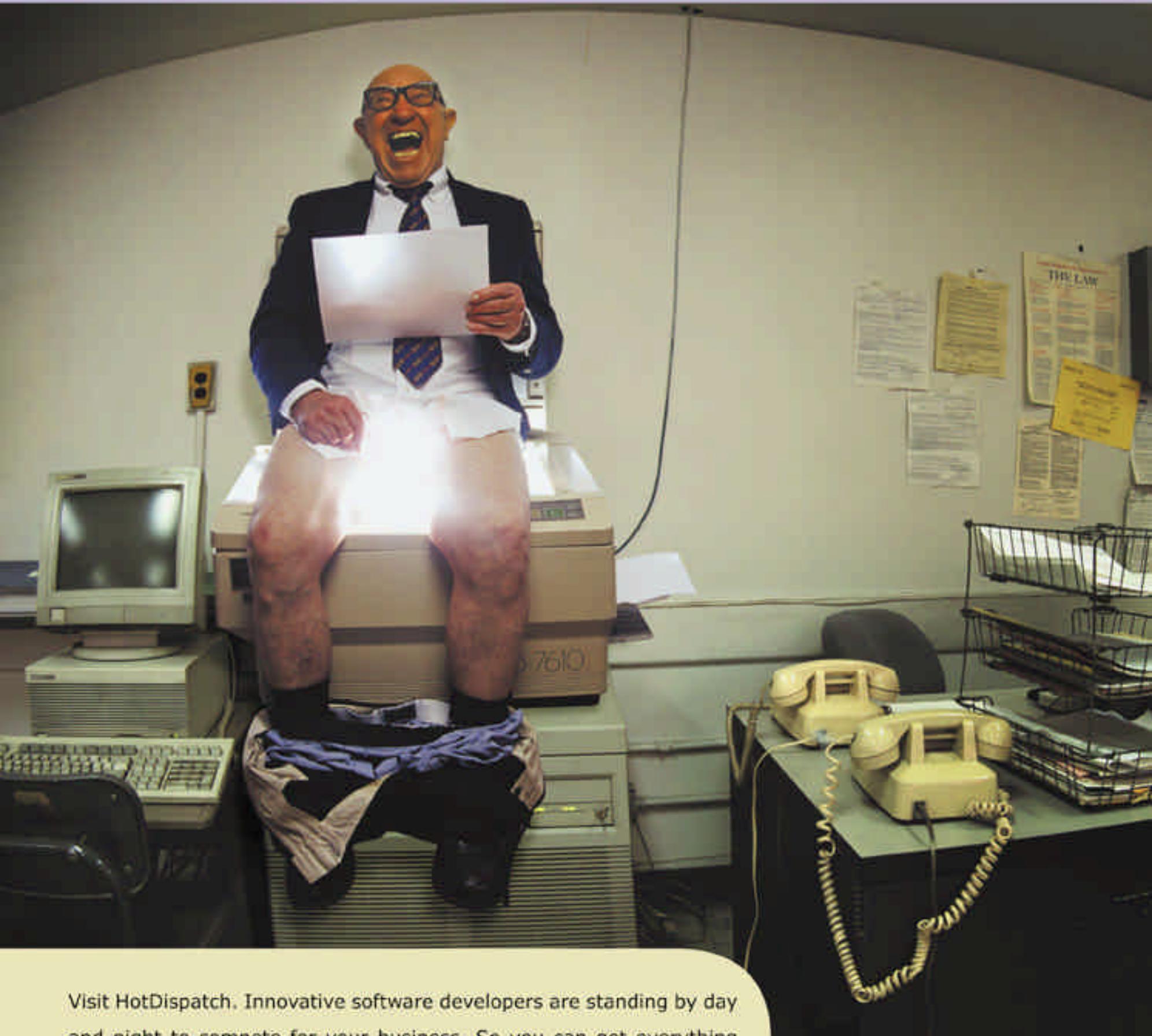
Tibco's XML Repository Mixes Private Schemas With Open

BY DOUGLAS FINLAY

XML schemas and vocabularies are quickly appearing front-and-center on developers' screens as the newest and most detailed processes for building e-business applications—and now Web services. And finding those schemas and vocabularies is increasingly easy with the availability of open repositories such as BizTalk.org , ebXML.org and OASIS.org.

Tibco Software Inc.'s new XML Canon/Developer repository takes the open schema one step further by including private schemas and vocabularies—with open public ones—to enable additional development of e-business processes for existing customer bases, adding public schemas where appropriate.

"We are working with these open-source organizations to enable the sharing of schemas and vocabularies," said Reid Conrad, chief technology officer for Tibco's Extensibility division. "But our customer base includes organizations whose requirements involve private-source environments as well, either for internal purposes or to collaborate with their partners and suppliers, and which involve private vocabularies," he continued.

Suggesting that XML Canon/Developer and open repositories both serve different requirements, he said that developers using XML Canon/Developer could create their own schema environments for their own benefit and yet co-exist with OASIS.org to interoperate with open schemas and vocabularies where and when necessary.

"We can now respect both public and private semantics," Conrad said, "to extend the XML implementation more effectively throughout the open-source initiatives."

He said that Canon/Developer, by facilitating both public and private schemas, could help developers increase their own market penetrability and customer reach.

"Perhaps a developer finds a supplier in a far corner of the world that needs only a schema for logistics," said Conrad. "The developer can provide that private schema without going to the open source to publish it first."

He added that developers whose clients have promotional programs based upon product volume or special product rela-tionships can establish a private forum for those clients to access metadata models customized specifically for those special requirements.

Conrad said that because schemas constantly change to reflect business-rule changes, XML Canon/Developer enables enterprises not only to set up e-business processes using XML schemas, acting as a repository, but also to share schema changes in real time with customers.

Within two weeks of its release to beta in early December at www.extensibility.com/tibco/solutions/xml_canon, there were more than 400 downloads, according to Conrad. XML Canon/Developer runs on Windows NT/2000 and supports SQL Server 7.0 and the Oracle 8i database. ∎

MontaVista Kit Ports VxWorks Apps to Linux

BY EDWARD J. CORREIA

In a move that embedded Linux developer MontaVista Software Inc. claims is not meant to lure customers away from Wind River Systems Inc., the company has released a VxWorks-to-Linux toolkit, including an emulator that the company said permits most VxWorks applications to run under MontaVista's Hard Hat Linux operating system unchanged.

Despite what appears to be a shot across the bow of Wind River, Bill Weinberg, MontaVista's director of marketing, said the tools are simply a fulfillment of the company's ongoing strategy of facilitating Linux development and migration. "We're not throwing down the gauntlet at Wind River; we're simply responding to real customer needs," he said. MontaVista last June released a similar set of tools for pSOS, an RTOS inherited by Wind River when it acquired Integrated Systems Inc. last year. Wind River has since halted development on pSOS.

For this reason, Weinberg said, pSOS customers may have been an easy mark. But aiming for VxWorks users hits closer to home. "We're shooting a little higher and a little harder," he said. "Wind River is planning on [phasing out] pSOS long-term, and customers who were acquired with the ISI acquisition know they are at risk. But going after the existing, presumably active customers is a little bit different."

Curt Schacker, Wind River's vice president of marketing and corporate development, said these efforts have not harmed Wind River in any measurable way. "We have seen no impact on our business from the pSOS transition kit, and I expect a similar outcome from this announcement," Schacker said. Wind River recently announced record-high quarterly revenues. "The entire quarter, the pSOS kit was available, so where's the impact? I regard the announcement of these 'kits' as gimmicks designed to attract publicity. They trivialize the investment that developers have made in professional tools," he said.

In a broader scope, Weinberg said that the new tools position Linux in a new league. "It substantiates the message that embedded Linux in general, and MontaVista's Hard Hat Linux in particular, is appropriate for all types of embedded applications, including those currently addressed by the long-standing proprietary technologies."

As with its pSOS counterpart, Weinberg said the VxWorks emulation environment will be most useful as a "first order port to test the viability of moving" VxWorks applications to Linux either as a prototype or as shipping product. Weinberg explained that in a first order port, "the whole application fits into a single Linux process and additional work on the application is usually done in another Linux process."

The kit, which MontaVista has released to the open-source community (ftp.mvista.com/pub/VxWorks), will be covered under existing MontaVista support subscriptions and will be included in future distributions of its Hard Hat Linux. ∎

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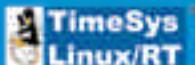
Pentek Speeds Up Host-to-Target Communications

SwiftNet streaming interface gives Pentium-to-DSP 10x performance improvement

BY EDWARD J. CORREIA

Embedded board-maker Pentek Inc. has released SwiftNet 4.0, a set of free tools that may help to bridge the gap in high-speed communications between a developer's host system and its targets.

According to Rodger Hosking, Pentek's vice president and co-founder, one of the challenges facing DSP developers has been obtaining high-speed host-to-target communications. "All the new features in SwiftNet 4.0 are designed to move data very quickly," he said, adding that engineers can expect to see a tenfold improvement from previous versions for typical Pentium host-to-DSP configurations.

This is accomplished, Hosking said, using embedded software. "We have a small kernel that runs on Pentek DSP boards that allows the communications," he explained, adding that the drivers also now support TCP/IP, enabling engineers to debug boards "on the other side of the country," if so required.

Features new to version 4.0, according to the company, are a double-buffering scheme that enables faster, more efficient nonblocking data transfers, support for DMA and 64-bit block VMEbus transfer, data-transfer thresholds that reduce interrupt latency, and simplified API functions for I/O.

Although SwiftNet supports only Pentek's boards, the SwiftNet interface allows for reading and writing to shared memory locations on non-Pentek boards, Hosking said. "We don't take over the VMEbus. You might have another kind of debugging tool also running on the host going over the same channel and targeting another board," he explained. "It doesn't restrict a user from using any other tools in addition to ours." Other bus technologies also are supported, including Compact PCI.

Hosking said that SwiftNet offers its broadest support for Texas Instruments' DSPs, including its C30, C40 and C6000 series chips, and will work with TI's ExpressDSP development tools and operating environment. Other supported DSPs include Analog Devices' SHARC. Pentek (www.pentek.com) plans to add support for the Motorola PowerPC around midyear.

SwiftNet 4.0 for Red Hat Linux is available now for free, and includes TI's Code Composer Studio. Pricing for runtime versions with EPROM-based firmware for an Ethernet-to-VMEbus gateway starts at $1,500. Versions for Wind River's VxWorks for 68030 and 68040 and PowerPC boards start at $2,500. SwiftNet runs on Digital Unix, HP/UX, Linux for Intel processors, Solaris and Windows 98/NT/2000, and supports various bus adapters, serial and parallel cables and Ethernet. ∎

Snap Goes the Java

Storage appliances to get boost from Jeode JVM

BY ALAN ZEICHICK

Snap Appliances Inc., a recent spin-off from storage company Quantum Corp., will be adding a Java Virtual Machine to the next operating-system version for its Snap Server network attached storage appliances.

For the Snap v. 3.0 operating system (www.snapserver.com), the company has adopted the Jeode JVM from Insignia Solutions Inc. "We've included all the APIs except for those which control a local user interface," said Jeff Hill, Snap's senior director of marketing, noting that the Snap Servers are managed via a Web-based browser interface.

According to Hill, the idea isn't to turn the company's Snap Servers into general-purpose server appliances, "We're not competing against the Cobalt [Networks Inc.] Qube," said Hill. Instead, the company wants third-party developers, as well as enterprises, to be able to customize the Snap Servers for specific applications, modify its user interface or add new functionality.

Hill cited PointBase Inc.'s Embedded Server database as an example of the types of third-party Java applications that can be run on the Snap Server using

The Snap Server 4100's new operating system includes the Jeode JVM.

the new operating system and JVM. By purchasing the Point-Base database, said Hill, a business could program a Snap appliance to act as a branch-office transaction server with greater simplicity than purchasing and configuring a general-purpose server to act as a database server.

The Snap 3.0 operating system will initially work only on the newest Snap Server 4100, said Hill, because it's the only one with sufficient processor power and memory to run the Jeode JVM and applications, as well as perform its usual functions as a network-attached storage device.

The new software is expected to be completed in the first quarter of this year. With the release of Snap 3.0, the company will also launch a third-party developer program. ∎

A GREAT TIME FOR EMBEDDED

The year that took ISI brought the IA, J2ME, NTE and ELC

BY EDWARD J. CORREIA

Like any growing industry, there was much consolidation last year among embedded companies. But few acquisitions have affected more developers than the takeover of Integrated Systems Inc. by Wind River Systems Inc.

Completed early last year, the acquisition of ISI brought about a halt in the development of pSOS—the company's pervasive RTOS—in favor of its own VxWorks, shifted ISI's Doctor Design moniker and consulting services to Wind River, and turned the company into a behemoth, boosting its support capacity to more than 700 engineers and technicians worldwide. The company recently reported quarterly earnings that were 37 percent higher than a year earlier. And as a result of this and other acquisitions, Wind River has announced that this year it will begin marketing development tools for RTOSes other that its own.

Also grabbing embedded headlines in 2000 was Sun Microsystems Inc.'s release of Java 2 Micro Edition, a set of specifications specifically designed for embedded developers. The specifications include a small-footprint Java Virtual Machine, and Connected Limited Device Configuration (CLDC) profiles. Many third-party tool vendors embraced J2ME with a passion.

Microsoft consolidated its numerous embedded divisions into the Embedded and Appliance Platform Group. Its new three-part embedded strategy included consolidation of its Windows CE and Windows NT Embedded development teams and the Server Appliances group. The company also released an update to its Windows CE 3.0 and Microsoft Windows for Express Networks 1.0, an OEM-targeted server appliance operating system and development toolkit. Despite its update, Windows CE continues to struggle for market share.

Linux steamrolled onto the embedded scene with the formation of the Embedded Linux Consortium. Describing itself as "a proactive consortium to promote the use of Linux in embedded applications," the organization (www.embedded-Linux.org) includes 45 founding members and hosts a series of trade shows and conferences held across North America. Countless companies are scrambling to shoehorn the operating system into smaller footprints and to make it more responsive.

And the Holy Grail of all these embedded efforts? The Internet appliance, of course. This broad term has been used to represent devices ranging from Web pads to toasters, all designed to draw upon the vast resources of the Web. The massive appliance market, which by most accounts is still largely untapped, is being tackled by notable veterans and unknown upstarts.

A handful of upstart companies have announced solutions aimed at managing the millions of Internet appliances we'll see in the years ahead, including Be Inc. for appliances running its own BeOS, Espial Group Inc. for Java-based devices, and Red Hat Inc. for Linux. Also offering or developing solutions are BSquare Corp. for Windows CE and Windows NT Embedded, and Wind River for VxWorks.

Looking toward the future, the single technology with perhaps the most far-reaching potential in the embedded space is InfiniBand, a specification created by a multivendor initiative (www.infinibandta.org), introduced last October. InfiniBand describes a multi-channel device connection fabric with speeds approaching 30GB per second. Intended to succeed the comparatively sluggish PCI, InfiniBand also has the potential to replace SCSI, Fibre Channel and even Ethernet. ∎

WIND RIVER

positive thing," he said.

Still, Revill described the question of whether offering high-quality tools compatible with competing operating systems would draw revenue away from its core RTOS business as a "nub of hot debate" inside

Wind River (www.windriver.com). "Through the mergers and acquisitions, the balance shifted inside the company from an RTOS-centric revenue and market opportunity toward the value of development tools," creating an equilibrium between the two, he said.

"The underlying message here is that we've grown up as

Wind River, and as an end-to-end solutions provider, we can't just wait around until you want VxWorks and then we'll give you the tools you want," Revill said "We have great tools, and it makes no sense for us to remove them from the customer base and to coerce them toward VxWorks. We're going to make invest-

ments in the stand-alone tools products."

Since the close of its acquisition of ISI last February, the company has continued to sell its inherited tools, including the market-leading Diab compiler and the Sniff+ code analyzer series. It will now begin development efforts to further them. "We could have

taken the 'old Wind River' approach," Revill said, "which was to wrap them into Tornado and make them available only if you buy our operating system." But many of the tools in their pre-Wind River existence, Revill added, had a "live-or-die mentality based upon the strength of their technology," giving them the depth to survive in a competitive marketplace. Wind River's Tornado development suite, on the other hand, while lacking similar depth in some areas, compensated with a tight integration of tools surrounding the company's flagship VxWorks, he said.

Now Tornado and its users also will benefit from the natural selection of the development tools industry as features of Wind River's acquired tools are spliced into it, the most recent of which was ISI subsidiary TakeFive Software's Sniff+ and its code analysis capabilities. The company also will continue to develop separately its pRISM+ development suite for pSOS customers but has halted further development of the RTOS itself, opting instead to wrap its main benefits into VxWorks in some later release.

Nearly a year in coming, the decision involved taking a close look at the development tools market for possible redundancies between the company's newly acquired tools and what it already was offering, Revill said. "We wanted to understand how the market valued every tool in our portfolio. Sniff, for example has project management and build capabilities, as do pRISM and Tornado. So the question became how to drive them together. Also, we had to ensure we fully understood the value of the stand-alone tool space to Wind River and to the market, and how we can drive them forward in a long-term commitment to the market."

Another major part of its strategy, Revill said, was based on how best to target VxWorks' largest competitor, the home-grown RTOS. "That's the growth opportunity for Wind River. The tools in that space, we'll say openly, are part of the strategic play to engage with those customers on tools and seek the opportunity when they're ready to displace the in-house RTOS with a commercial RTOS." ▪

Creating a 'Rappore' With Wireless

BY EDWARD J. CORREIA

Rappore Technologies Inc. has bet its business on Bluetooth. Founded in August of last year, the start-up company this month is scheduled to release its premiere offering: the Bluetooth Protocol Stack and SDK, a communications stack and set of free development tools based on the forthcoming Bluetooth 1.1 specification for creating low-power radio-frequency connections between wireless devices.

The world will be driven by wireless apps, says Rappore's Hogan.

According to Bill Hogan, Rappore's president and CEO, his company (www.rappore.com) hopes to generate revenue by providing developer support and selling runtime licenses for Bluetooth applications it is developing. "We see a tremendous opportunity to bridge the wired world of today to the wireless world we're going to," he said, a world that will be driven by applications. "We are developing applications that will run on our Bluetooth stack and embrace other wireless standards as well."

For its initial release, the tools will run on *x*86-based Windows hosts and target devices running the Embedix embedded Linux operating system from Lineo Inc. Hogan said the tools will work with a developer's existing tools, including the Embedix SDK. "We're not reinventing the wheel. A developer can come in and use the tools they always have. In fact, we've gone overboard on the documentation on the interface that we're providing. We thought people would be resistant to using another stand-alone environment."

Hogan said Rappore's tools will include design, debugging, testing and certification applications plus development support services—all targeted mainly at OEMs. "Our customers are going to be major manufacturers that are building wireless devices. Companies we're talking to now are building laptops, handheld devices, telephones and residential gateways."

Gordon Mella, Rappore's director of marketing, added that target customers also might include any company that could benefit from eliminating cable connections, such as the serial connectors used in enterprise infrastructure, he said.

Hogan said Bluetooth (www.bluetooth.com) makes ad hoc networks possible cheaply. He illustrated his point with an example involving an airline that broadcasts flight schedules to Bluetooth-enabled handheld devices in its airport terminals. The goal of the Bluetooth designers is to create a chip set for around $5. But getting the chips now? Hogan likened that job to "getting hens' teeth." Intel has announced that it is planning to release a Bluetooth chip set this year.

Hogan is confident that building tools for the unreleased Bluetooth 1.1 specification is the correct strategy. "What we've been hearing over the last couple of months is that folks are still having a lot of pain in designing Bluetooth implementations. The specification itself is pretty complex," he said, adding that Bluetooth 1.1 specifically addresses some of these issues. "Because of the experience our team had with implementing earlier specifications, we will be prepared to work with customers on backward compatibility. We're urging everyone to go to the new spec." ∎

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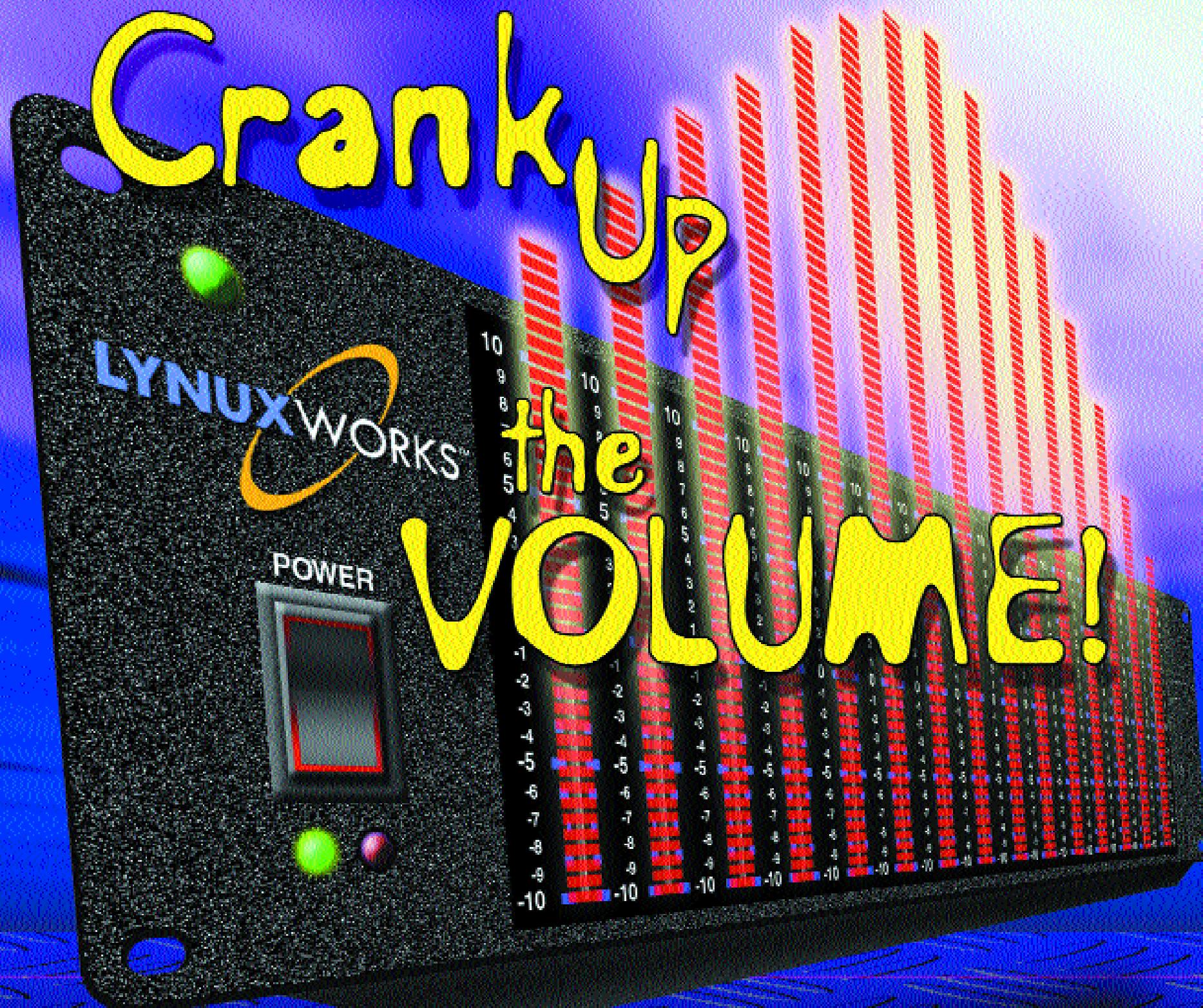
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Ready For Prime Time?

Robustness, scalability, tool issues
slow enterprisewide Linux acceptance

BY LISA MORGAN

Linux is finding its way into all sorts of enterprises—usually through the backdoor, as PCs, Macs and LANs once did. It's an increasingly popular operating system, but unlike Windows, there aren't a lot of highly integrated and visual tools from which to choose. The lack of shrink-wrapped products and support is holding enterprise development back, according to observers, for two reasons. First, not everyone is comfortable with command lines. Second, visual tools and component reuse speed time-to-market.

"Tools, schmools," said Craig Harper, chief technology officer of Chapter 2 e-services Inc. (www.chapter2.com). "I don't need tools because I build my own. With Linux, I have access to the kernel so I can build whatever I need, rather than hope some vendor comes out with the thing I want…someday."

To some Linux developers, the open-source kernel has made such personal innovations not only possible but preferable. Windows shops are accustomed to visual tools, a graphical environment, component architectures and the little things, such as installers. With Linux gaining popularity in the enterprise, a collision of the command line and graphical tools is imminent.

Operating-system vendors like Red Hat Inc. include scores of open-source tools on their CD-ROMs, and although many are starting to include enhanced tools, they still don't have the same level of integrated tools that one sees from an operating-system vendor like Microsoft Corp. or Sun Microsystems Inc. With Linux, no one company is driving the vision. It's a collective effort. As a result, there is no reigning champion of Linux development tools.

Earlier this year, Evans Data Corp. (www.evansdata.com) released a study of more than 300 Linux developers. Seventy-five percent said their compilers and editors were only adequate, and 10 percent to 50 percent rated GUI frameworks, as well as modeling, error-detection, code-management and testing tools adequate. Further, the developers didn't seem to care whether they were using open-source or proprietary tools. The conclusion of the report was that Linux development tools needed to improve.

A subsequent study of more than 300 Linux developers by Evans revealed more than a 50 percent increase in Linux applications being written for wireless devices between February and August 2000, and that 50 percent of those developers planned to develop applications for internal corporate use.

"Linux is growing 88 to 212 percent per year, depending on whose numbers you believe," said Mike Wilkinson, product manager at Caldera Systems Inc. (www.caldera.com). "Linux is a stable, reliable, cheap and customizable platform on which to build applications. The problem is, developers expect to have tools, and end users expect to see products."

Carl Hartman, vice president of e-business management at Computer Associates International Inc. (www.cai.com), asserts that the lack of tool integration is a setback in enterprise development, as is the lack of a standard GUI.

"Windows is Windows," he said. "If you're developing in Windows, you're using graphical tools. Linux has a Darwinian extinction going on. If people think a tool or application is lousy, they post questions to the community. Enterprise developers want better, more stable solutions. They also want the best price/performance at the lowest cost."

Kim Knutilla, chief technology officer at Red Hat (www.redhat.com), admits

CA's Hartman says lack of tool integration is a setback for Linux.

that Windows and Solaris have advantages over Linux in the enterprise. "With Windows, you have RAD development environments for some applications. Visual Basic is awesomely productive. Linux tools are not equivalent at this point. They're just not as mature as some of the other tools," he said.

Dan Kusnetzky, program director of open environment and serverware research at IDC (www.idc.com), noted that Linux is not yet part of the corporate mindset. Windows NT and Windows 2000 are acceptable development platforms for work groups or business units but not critical applications. Solaris, on the other hand, is acceptable at all levels.

STEPS IN THE RIGHT DIRECTION

Linux vendors racing to introduce RAD, GUI tools

BY LISA MORGAN

Linux development tools may have a way to go, but vendors are starting to make progress. News on the Linux tool front includes RAD, GUIs, cross-platform development and Linux 2.4 support from brand-name vendors. Some of these will be formally announced and launched early this year.

LINUX 2.4 SUPPORT

Caldera Systems Inc. (www.caldera.com) recently announced its Linux 2.4 Technology Preview. The package includes Caldera's OpenLinux technology platform, a preview version of the Linux 2.4 kernel, C/C++ Linux development tools, gcc 2.95.2, the Sun Java SDK 1.3, Java HotSpot, a preview version of KDE 2.0, xFree86 4.0 and glibc 2.1.91 for $19.95.

Red Hat Inc. (www.redhat.com) has released its Linux 2.4-compatible Red Hat 7.0. It includes an updated development tool set with gcc 2.96, gdb 5.0 and glibc 2.2; Web application development tools such as PHP and Zope; and a pre-

view of GUI development tools including the GTK+ 2.0 widget set, Pango and Inti. The price is $29.

TurboLinux Inc. (www.turbolinux.com) is also poised to support Linux 2.4. Its Workstation Pro 6.1, designed for enterprise developers, includes a broad range of tools, such as Borland JBuilder, Sun Forte for Java Community Edition 1.0 release update 1 and IBM HomePage Builder. TurboLinux Workstation Pro 6.1 TurboTools are designed to speed the configuration of networks, printers, user accounts and a wide variety of other system settings. The price is $79.95.

RAD

Rapid application development (RAD) radically changed Windows development, and now some vendors are coming out with RAD tools for Linux.

Borland Software Corp. (www.borland.com) will release a Linux version of Delphi during the first quarter of 2001 (due originally in 2000) that supports both GNOME and KDE user interfaces. A Linux version of C++ Builder will follow.

Borland's Kylix project, also slated for release in 2000, has been pushed back to the first quarter of 2001. Sources inside the company are now targeting a January launch. Kylix will be a component-based development environment for two-way visual development of GUI, Internet, database and server applications.

Omnis Studio from Omnis Software (www.omnis.net) is another RAD tool. It was designed for enterprise, mission-critical and e-business applications. Using the tool, developers can build form-based client applications that access all leading server databases, including Oracle, Sybase, DB2 and Informix, as well as all ODBC-compliant databases, such as MySQL and MS SQL Server. The list price is $149.99

CROSS-PLATFORM TOOLS

Borland's Kylix is a cross-platform tool. So is Visual MainWin from Mainsoft Corp. (www.mainsoft.com). MainWin is an application porting platform that will support Red Hat Linux 6.1 and 6.2 early in 2001. Visual MainWin currently enables Internet infrastructure and application software developers to develop Windows applications and deploy them simultane-

RIGHT DIRECTION

ously on Windows and Unix. Visual Main-Win is integrated with Microsoft's Visual Studio. It recompiles Windows source code with other platform compilers to create native applications. Visual Main-Win is available free for a 30-day trial and is sold for $2,495 per user.

Metrowerks Corp.'s (www.metrowerks .com) CodeWarrior integrated development environment (IDE) is available for Red Hat and SuSE distributions. The Red Hat Linux and SuSE GNU 4.0 editions come with native C/C++ compilers, assemblers and linkers hosted on Red Hat Linux. They also include a project manager, an integrated editor, an intuitive file-compare facility, a multifile text-search capability and error management. CodeWarrior project files may be interchanged among platforms, making it easier for multiplatform development teams to share files and work together. Both packages sell for $124.95 each.

Because cross-platform capabilities are important to enterprise developers, companies like Rational Software Corp. (www .rational.com) are slowly gravitating toward Linux. According to senior product manager Jeff Hammond, Rational does not have any solutions developed

Rational supports Linux through Java, says Hammond.

for Linux developers by Linux developers yet, but provides some support for Linux indirectly through C++ and Java. Rational's Rose ships with C++ add-ins, for example.

"Sixty to 65 percent of our customers are working in the J2EE world, which is heterogeneous," said Hammond. "We are supporting Linux today, primarily through Java. It will be another 18 to 24 months before all our products [fully] support Linux."

Speaking of Linux support, how can one overlook IBM Corp.? IBM has an Application Development Kit for Linux 2.0 CD that includes DB2 Universal Database Enterprise Edition 7.1 for Linux; IBM WebSphere Application Server, Advanced Edition 3.02 for Linux; and Lotus Domino Server 5.0.4 for Linux, Global Edition. The CD also includes MQ-Series for Linux 5.1 Technology Release; VisualAge for Java for Linux 3.02; the IBM Developer Kit for Linux Java 2 Technology Edition; and version 1.3.0 of the Early Release developer kit. The CD is freely downloadable to registered developers.

Increasingly, when the topic of cross-platform development comes up in regard to Linux or any other platform, Java also comes up. Sun's Forte for Java Community Edition provides an integrated, extensible develop-

ment environment for the Linux operating system. It offers integrated visual design, editing, compilation and debugging capabilities to implement J2SE and J2EE applications for the Linux platform. The Forte for Java Community Edition binary release is available for download at www.sun.com/forte /ffj/ce. The source code is available at www.netbeans.org, an open-source development Web site hosted by Collab.Net and sponsored by Sun.

The Linux releases of J2SE and J2EE include the same development tools and utilities found in ports to other operating systems. These include tools for creating GUIs, as well as accessing databases, directories, CORBA-based back-end systems, security and APIs. Sun has also released various media APIs for Linux. Registered developers can download the J2SE and J2EE software development kits. The J2SE SDK is available for downloading at http://java.sun.com/j2se/1.3 /download-linux.html. The J2EE SDK is available for downloading at http://java .sun.com/j2ee/j2sdkee/.

GUIS

Integrated Computer Solutions Inc. (www.ics.com) offers Open Motif Everywhere, which is ICS' distribution of Open Motif. It includes Open Motif source code, a postscript version of the Motif 2.1 manual set and the Motif GUI toolkit. It has been tested on a number of

distributions, including Corel, Mandrake, Red Hat, SuSE and Turbo Linux. The price is $29.95.

Metro Link Inc. (www.metrolink .com) now offers Metro Motif Complete, which includes full distributions of Motif: 1.2, 2.0 and 2.1 on one CD-ROM. The tool allows developers who want to develop for multiple versions of Motif on the same system to install additional development environments simultaneously—without installing and removing software. It is available for $149.

PACKAGED EQUALS ACCOUNTABLE

With name vendors behind the tools, developers can hold someone accountable when things go wrong.

"I don't think the quality of open-source tools is really an issue," said Andrew Weiss, chief technology officer of Merant International Ltd. (www .merant.com). "If you're having problems with a tool, you can post a question and the community will answer you fairly quickly. The problem is accountability. Enterprise developers, particularly the application developers who don't have a command-line orientation, want to grab someone—a vendor—by the collar and force them to make things work."

True, Linux tools don't stand up to Windows tools yet, particularly for those developers who want more rapid, reusable, visual tools, but vendors are moving in the right direction. ∎

PRIME TIME

Linux is a popular operating environment for servers and embedded devices, but Kusnetzky said the problem with Linux is that there are no major applications on Linux yet, so a lot of chief information officers will simply say, "No Linux." Linux will continue to come in through the backdoor, however.

"Linux users are spread out all over, and a lot of corporate IT people don't know it," he said. "Some have Linux installed on old Windows machines because it doesn't require the same kind of specifications to run. The IT guys just see a lot of old Windows boxes out there. Linux has not become an enterprise operating system, however."

According to IDC, Linux has only 4 percent share of the desktop. Windows has 90 percent, MacOS has 5 percent, and the others account for 3 percent. As a server operating system, IDC claims that Linux has 24 percent market share and is second to Windows with 38 percent.

"When it comes to desktop applications, it's a whole new ballgame," said Red Hat's Knutilla. "Enterprises don't want to retrain their Windows applications users, and from a developer standpoint you have to be able to see dollar signs. The problem with Linux tools and applications is the notion of 'free.' Sure, Linux can save enterprises a lot of money on licensing fees, but vendors have to be able to survive."

John Pompeii, chief technology officer at Secant Technologies Inc. (www.secant.com), said there's a big difference between using open source and distributing open source. Secant is working on a Linux-based product that will "supercharge" Apache servers by adding clustering, content management and a Web management environment. Secant will make related development tools available free to developers, but if the applications are deployed commercially, runtime versions must be purchased.

LINUX COMMUNITY MORPH

Like the Internet community, the Linux community is growing and evolving. Those deeply entrenched in traditional open-source development may not welcome the changes enterprise developers may bring with them, such as visual tools. Already, open-source development groups are considering how the new community of enterprise developers will use and deploy the solutions they build.

"About 20 to 30 percent of the people in [collaborative working groups] are bringing up the concerns Windows developers will have," said Red Hat's Knutilla. "We need to understand what they're writing, which tools they need, and what kind of windowing style they prefer, among other things. Then you have to consider which of those features gets in the way of the Linux kernel. Based on those discussions, we ask ourselves, 'What kind of change [does the open-source community] need?' "

IDC's Kusnetzky thinks that enterprise development on Linux will continue to lag. Despite the growing list of applications from companies such as Apache, Lotus, Oracle, Pick and SAP, Linux is still not an enterprise platform and won't be for another two to five years, he said.

THE NEXT GENERATION

The new Linux 2.4 kernel, released in December, goes further to better support the needs of the enterprise. The networking layer has been reworked, and it will now support multiprocessors as well as the USB. The big benefit for enterprise developers is better scalability.

Caldera, Red Hat, SuSe and Turbo-Linux are poised to support the new kernel; however, the improvements to the kernel are considered evolutionary as opposed to revolutionary.

Although Linux continues to be the fastest-growing operating system on the market, its potential as an enterprise development platform has yet to be realized. That should please Microsoft. At least for this year. ▮

From Server to Appliance to Server

Computing trends are cyclical. One could argue that the app server is a reinvention of the mainframe. One could also argue that the new breed of programmable server appliances is a reinvention of the general-purpose server.

Remember the pitch behind the server appliance? Customers want a finely tuned operating system and hardware that's simple and reliable. Even more, they wanted locked-down applications optimized for a specific function, and which their administrators couldn't mess up. A file server appliance shared files, nothing more. A print server appliance managed print queues, and that's all. An e-mail server appliance implemented POP3/SMTP—no more, no less. When customers want the ability to add their own applications software, they should buy general-purpose servers running general-purpose operating systems, such as Linux, NetWare, Unix or Windows.

Now the pendulum is swinging the other way, as companies such as Cobalt Networks Inc. and Snap Appliances Inc. are opening up their appliances to third-party applications, and providing SDKs so that even enterprise developers can build custom applications to run on those platforms.

Are those devices still appliances? Yes, but the lines are blurring, and not necessarily for the better. What they are gaining in flexibility, they may be giving up in simplicity, ease of deployment and administration, and reliability—which are, after all, the reasons why customers flocked to server appliances over the past two years.

The UDDI Factor

Call it M-to-M. XML developers have learned that it's not enough to have a common language for businesses to communicate over the Internet, or even a common vocabulary for expressing commands like "What's the price?" and "I'll take a dozen." The real benefit of B-to-B commerce is M-to-M—many-to-many business relationships. When enterprise applications have the power to automatically roam the Internet, searching all possible suppliers for products and services, e-commerce will have truly arrived.

The heart of the M-to-M commerce model is UDDI— the Universal Description, Discovery and Integration project—which went live for public testing late last year. The main job of the UDDI project is to build an online registry in which suppliers can describe their businesses, and customers can search to find potential vendors. A side benefit is that the project is defining a common vocabulary that companies can use to describe their products and services. Forget SIC codes; UDDI is looking toward the future.

Sponsored by Ariba, IBM and Microsoft, UDDI (www.uddi.org) is widely adopted and supported across the technology industry; over the past few months alone, its membership has tripled to more than 130. It's too early to predict UDDI's success or how it will evolve and grow. But it may be the best effort yet to bring order to the M-to-M commercial Internet. ∎

DEVELOPING B-TO-B SOLUTIONS IN INTERNET TIME

The term "business to business" has quickly entered the business vocabulary, but its meaning remains unclear. Although the term is widely employed, few understand its implications or breadth. In short, B-to-B is a redefinition of the way businesses interact with their customers and suppliers. Previously, B-to-B interactions such as Electronic Data Interchange (EDI), fax and phone operated in batch mode or contained limited content. New technologies such as the Internet and XML allow for secure, real-time integration of business processes among organizations.

MICHAEL LEVY

When implementing a B-to-B solution, one should begin with a set of questions requiring both technical and business analysis: How should we interact with customers, suppliers and net markets (hereafter referred to as partners)? How do we design processes and share information with these partners? Which back-end systems, such as enterprise resource planning (ERP), customer relationship management (CRM) or databases, will be included in the virtual enterprise? How do we develop this B-to-B solution in "Internet time"?

To simplify this problem, one should view a B-to-B solution as a series of smaller integration projects that can be quickly deployed. B-to-B projects can then be analyzed as a set of interfaces between a company and its partners along with a set of internal communications. The complexity of the project is then assessed as the number of links (both internally and externally) and their associated processes requiring development. The project manager can then calculate project duration as the time required to create each of these linkages.

Today, B-to-B communications among partners typically employ XML. Due to the explosion of XML dialects and the business requirements associated with different processes, no single interface will cover all of your partners. For example, an interface with the Ariba marketplace will require cXML support for the Ariba network

while a supplier may wish to conduct business using OAG Business Object Documents (BODs). Your B-to-B strategy should, therefore, include a strong XML translation tool.

The initial phase of a B-to-B solution will typically be defined as the implementation of a partner linkage and will run somewhere between four and 12 weeks. The implemented prototype should provide all the basic functionality and should not be viewed as a throwaway effort.

B-to-B projects differ from more traditional projects in their definition of success. Whereas technology-driven projects tend to quote figures such as the number of database queries that must be performed in a minute, B-to-B projects will have more business-oriented performance needs. Success should therefore focus on metrics, such as how quickly a link can be added or modified, how many concurrent interfaces can be managed, and how many purchase orders can be processed concurrently or per minute?

Other possible business-based questions include: Can I provide real-time responses to external process requests (e.g., inventory checks to my customers, purchase request acknowledgements, etc.)? Which manual operations (phone, fax and e-mail) can be replaced by automated interactions with my partners? What are the associated cost savings? Should I participate in online markets? Do I wish to locally host my catalog or upload it to a marketplace? How well can employees and partners monitor process status?

The abstraction in B-to-B implementations should be at the business level, not at the code or object level. These abstractions take the form of rapidly evolving XML schemas and dialogs that define either collaboration or representation standards. Collaboration standards define how and when the different parties interact with each other, while representation standards define what the data should look like.

These standards are available to any business and can be developed generically by solu-

tions providers. As the standards are generally defined in terms of XML, the solution provider should also provide a set of XML-based tools that allow new standards to be quickly and easily modeled.

XML IMPLEMENTATION

As your partners may vary in size and technical sophistication, your B-to-B solution should include support for various connectivity models. While a large company may be able to immediately process an XML message and forward a response, smaller partners may require lightweight solutions such as a Web browser or WAP-enabled device. Your solution should therefore support multiple XML dialects along with HTML and WML. As some partners may require EDI interfaces, a B-to-B solution should also support XML/EDI translation. Protocol support should include HTTPS, FTP, WAP and SMTP. For security, features such as encryption, digital certificates, access control lists and nonrepudiation should be evaluated.

Data transformation tools allow developers to flexibly and rapidly project data into many formats. XML support should include OAG, Rosetta-Net and BizTalk along with net market dialects such as cXML (Ariba) and xCBL (Commerce One). Additionally, a B-to-B infrastructure solution should include the ability to locally host rich net market content (a process Ariba refers to as "punch out").

Likewise, back-end integration will vary in complexity, based upon whether the back-end system can speak XML and the availability of EAI adapters and XML translators. A B-to-B solution should broadly support connectivity and data translation to applications such as ERP, data warehouse, SCM and relational databases.

Solutions providers have taken two approaches to enabling B-to-B communication. The first model views B-to-B as a middle-tier message/response system. This option directly ties back-end systems and data formats to B-to-B interfaces. Although it may be faster to deploy when simple messaging

MIDDLEWARE, MICROSOFT STYLE

COM, DCOM, COM+. ActiveX, OCX, VBX. Microsoft Transaction Server, Microsoft Message Queue, Microsoft Distributed Transaction Coordinator, Windows Distributed interNet Applications.

Confused by Microsoft's component technologies and the role of Redmond's middleware in distributed applications? It's hard to imagine a better teacher than Roger Sessions, editor of the ObjectWatch newsletter and president of ObjectWatch Inc., a training and consulting company based in Austin, Texas.

In "COM+ and the Battle for the Middle Tier," Sessions takes readers on a thought-provoking, opinionated and enjoyable ride through the world of Microsoft's middleware technologies. Sessions, though he's favorably disposed toward Microsoft's technologies, is no company shill or apologist: For years he favored the CORBA approach toward distributed object technology, and in 1992 was IBM's representative on various Object Management Group committees. He's had the opportunity to watch the evolution of Microsoft's COM since its origins in 1993, and the creation of DCOM in 1995. Gradually, since then, Sessions became a specialist in Microsoft's component-oriented middleware.

Sessions' gift has always been to find easy ways of explaining complex technologies, and he's in top form in this chatty, conversational book. Very few of his examples use programming code, his analogies build naturally upon each other, and the charts and graphs make this book accessible to both programmers and technical managers who need a solid overview but don't need to understand all the gory details.
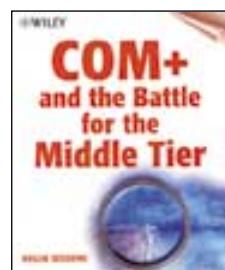
The first part of the book, which is introductory, starts with what appears to be an overlong narrative about Sessions' morning coffee routine of ordering a Doppio Macchiato at his neighborhood Starbucks. Fine, fine, he's using a coffee shop to explain the role of middleware in high-volume transaction processing…but surprisingly, despite its simplicity, the analogy holds and creates a logical framework for the rest of the book, so don't skip it. The next few chapters provide a contextual definition of components and explain the essential role of transaction-processing monitors (TPMs). These are key concepts in understanding transaction-oriented distributed computing.

A relatively short but vital chapter introduces what Sessions calls COMWare—the integration of a component system, a component runtime environment, administrative tools and interoperability services. He explains the different parts of the COMWare system, how they integrate to form a complete system, and where the bottlenecks to high-performance transaction processing can occur. Out of this COMWare framework grow the three main COMWare platforms available today: Microsoft's COM+, Sun's Enterprise JavaBeans (EJBs) and the CORBA Component Model (CCM).

(Sessions likes to make up his own terms, like COMWare, and to define other terms differently than Microsoft does, though it must be said that at least his terms are consistent and Microsoft's aren't. Sometimes he acknowledges and attempts to resolve the confusion, but sometimes he doesn't.)

The second section, dedicated to COM+, constitutes the real meat of the book, and provides the clearest explanation I've seen—Microsoft's own literature included—of the many parts of the company's component strategy. Sessions' job isn't an easy one, particularly because the Microsoft architecture (for which he invented the acronym MDCA, or Microsoft Distributed Component Architecture) arrived piecemeal. Major parts arrived in an Option Pack for Windows NT 4, and nearly everything was rewritten for COM+, which is integrated into Windows 2000.

The discussion of COM+ focuses on four areas: queues, components, the runtime environment and services. In roughly 170 pages of very readable text, Sessions walks through each of these areas, showing how Microsoft has implemented each of these COMWare elements, and how it works. Sessions is honest: Although he clearly likes COM+ and has built his training business around Microsoft technologies, he's not afraid to show where the architecture is confusing or inconsistent.

The third section of Sessions' book discusses "the competition"—EJB and CCM. It's a fairly evenhanded discussion of both platforms, though in his analysis both come off second-best to COM+. Compared with EJB, for example, he asserts that COM+ is more mature, has a better event model, is language independent and is "free" with Windows 2000. Compared with CCM, COM+ is less mature in some areas, but more so in others—but more important, he writes, "The OMG CCM specification is nothing but paper, without even promises of support from the major vendors."

Sessions wraps up "COM+ and the Battle" with three case studies, and then moves onto a conclusion, in which he offers advice for buying a component model. He tries to be balanced, but his biases show through. For example, he starts by recommending not only Microsoft but also IBM, BEA and Sun as likely to be the most successful middle-tier vendors. He then points out that IBM has a habit of abandoning technologies—OS/2, SOM/DSOM, OpenDoc, Taligent and CORBA—whereas Microsoft appears completely committed to COM+.

"COM+ and the Battle for the Middle Tier" represents not only the clearest explanation of Microsoft's technologies that I've read, but also one of the best explanations of distributed components and modern transaction processing. If you are using or considering Microsoft's COM+ platform, Sessions has provided a solid resource for the entire development team. And even if you're an EJB shop, it's worth a read, if nothing else but to help you understand how the other guy's technology actually works. ∎

"COM+ and the Battle for the Middle Tier." Roger Sessions, John Wiley & Sons, 2000. Trade paper, 442 pages, $39.99.

Alan Zeichick is editor-in-chief of SD Times.

GUEST VIEW

is required, this model requires significant custom coding for building and maintaining complex processes.

Moreover, due to the tightly coupled nature of the system, cost of ownership over time can be significant. Any changes to the partner or application interface have a systemic and potentially major impact on the operation of your B-to-B network.

The second approach architects the hub with a business-process approach. By providing a platform to unite back-end systems with common business rules and business-process modeling, this approach provides a much greater degree of flexibility. It also provides a more loosely coupled architecture that can more effectively accommodate the changing and dynamic world.

Beginning with the prototype, the solution should include B-to-B infrastructure software. In evaluating this software, the IT architect should evaluate the vendors' abilities to communicate with back-end systems, manage and transform messages, and coordinate and extend processes to partners.

B-to-B infrastructure software reduces deployment time by leveraging existing business process flows and data definitions. An infrastructure software approach also reduces ongoing maintenance related to evolving standards and protocols. In addition, a solutions provider should be able to provide scalability and performance statistics allowing the IT group to project future performance.

Finally, by employing B-to-B infrastructure software, the IT shop can focus on meeting fundamental business needs and quickly extending the B-to-B solution to additional partners. This shift in role requires developers and business analysts to take a multi-enterprise business-process approach in their development efforts. ∎

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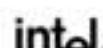
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IDG WORLD EXPO

SDT 010

PREDICTIONS FOR THE NEW DECADE

Only those annoying high-school nerd types still point out that the millennium celebrated so conspicuously last year actually begins the first day of 2001, thanks, I understand, to the poor wretch who designed the calendar adopted by the Church to start the Christian era in year 1.

This sensible step has allowed the dawning of centuries and millennia to be celebrated twice, and it has provided pundits in the press two opportunities to predict what the future will hold. A year ago, this column did not exist, so for me this is my one shot. However, had you asked me then, my only pertinent prognostication would have been that the Nasdaq is headed for a big-time correction. Of course, I was not alone in this: There was also the one kid who was yelling that the emperor had no clothes. What then for 2001?

First, the easy stuff: **The Extensible Markup Language** is getting here in a big way. Expect to hear lots more about it. Expect to be asked about your strategy for integrating it into your site. Start thinking about rolling out pilots. The pressure will come from the outside to be able to handle documents and transactions in XML. Before year's end, the one new computing device every site will have to buy will be an XML server.

The use of XML as an adjunct to (or replacement of) HTML will be hampered by different implementations in the browsers. Since to date Netscape's Navigator and Microsoft's Internet Explorer still do not render basic HTML the same way, don't expect things to improve with XML. The market will side with IE's implementation as the reference, not only because of Microsoft's dominating browser market share, but also because of its active participation in the promotion of XML.

The **Java Message Service** will revolutionize middleware. Middleware will no longer be seen as the lingua-franca front end to disparate business applications. Rather, it will be recognized as the necessary conduit between all data sources and data sinks in the enterprise. The renaissance caused by JMS' low price and universal interface will be so widespread that many people will come to wonder how enterprise computing was ever performed without middleware.

Microsoft's **Simple Object Access Protocol (SOAP)** will continue to gain popularity and will be adopted as a Web standard, although in a different form so that Microsoft will not have control of it. This measure will not prevent Microsoft from implementing its own version of SOAP by adding unique extensions.

Privacy and security will remain the key social issues of the distributed enterprise.

As to things that will not happen: **C#** will not catch on. However, before everyone comes to this conclusion, the technical press will do a protracted analysis of the language, including interviews with early adopters and reviews of the tools—as well as presentations on how C# differs from C++ and Java and how it's the linchpin of Microsoft's future strategy. Only by year's end will the press concede what the majority of developers will know immediately upon first examination: The nag, she is dead.

CORBA technology will continue a long dissolution into other technologies that will offer the same benefits without having to use the same functions—Java's enterprise technologies being the leading solvent here.

Novell will know no rebound. In perfect echo, **Windows 2000** will become the standard desktop platform and low-end server platform. By year's end, Windows 2000 will become common on laptops. **Linux** will see continued acceptance in commercial environments. However, its growth will proceed at a less heady pace and will no longer be accompanied by the chanting and clanging of cymbals performed by its evangelists—a tribute to their successful work on its behalf.

Finally, the technology that will neither advance nor decline in the coming year is **wireless**. Everyone wishes that wireless worked better and that universal access to the enterprise without wires were a reality. Forget about it. The technology to do this consistently well is not sufficiently universal for wireless to fly in a big way. Likewise, demand for it is not sufficiently high to act as a catalyst for the necessary infrastructure investments to be made. Long term, of course, wireless will become standard, but for the time being, the technology and investment are too high in comparison to the demand. Expect real progress to occur in several years—not before then.

Forecasting is a dangerous art. But these predictions are the ones that currently color my view. Send me yours. ∎

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MIDDLEWARE WATCH

ANDREW BINSTOCK

A SWEET CONTRIBUTION FOR 2000

The end of 2000 sings of a bad year for tech stocks and a difficult year for Microsoft, but was it a bad year for technology professionals? Not if you're a tech pro who uses technology birthed in Redmond. After all, while I have my gripes about Windows 2000, all its iterations are a step up from Windows NT. And though most of its additional technology "contributions" for 2000 amount to little more than wispy promises, the company has delivered some sweetly tangible stuff to help our frenetic existence. While it may sound boring, my favorite Microsoft product of this year is SQL Server 2000.

Databases may make marketing guys yawn, but they're the guts of just about any e-business. If you, like me, are somewhere near the front lines of building an e-business back-end system, then we both appreciate the ability to utilize options. Like Sun for servers or Cisco for switching equipment, Oracle has managed to maintain its go-to status for harried chief technology officers who need to make difficult long-range technology decisions in far too little time. Going with a perceived best-of-breed leader is always a safe bet.

But any such decision always comes at a price. In Oracle's case that is a lit-eral statement, as its enterprise customers quickly realize when they read the fine print on those licensing agreements. They're nothing short of eviscerating. That's not to say that SQL Server 2000 is cheap, but it's definitely less expensive than Oracle. IBM's DB2 is another option, but lately Big Blue is doing the same kind of tight product-line integration that got Microsoft into trouble. Buy DB2 and you should use Visual Age development tools (not my favorite); buy Visual Age and it wants to use WebSphere.

By contrast, SQL Server 2000 is actually fairly open. A big step forward is that you no longer need to be running Windows NT Enterprise Edition or Windows 2000 Advanced Server to make SQL Server 2000 run. Standard editions of these operating systems will suffice for even the Enterprise Edition of SQL 2000. I also like its ability to exploit Microsoft's new clustering capabilities as well as the new English Query, which lets developers show users the Question Builder model. That means users can actually perform advanced queries visually via drag and drop. But on the e-business front, my favorite step forward for SQL Server

WINDOWS WATCH

OLIVER RIST

2000 is its ability to use Analysis Services (AS) to exploit data warehouses.

While Microsoft has actually billed Analysis Services as a database server unto itself, that isn't strictly accurate. AS runs as a service under Windows NT or Windows 2000 and interjects itself between the data warehouse database and your reporting tool. As a developer or user, you'll most often touch AS via its front-end interface, called Analysis Manager. This app uses an underlying instruction layer, dubbed Decision Support Objects (DSO), to communicate with the actual AS application. AS is not a database unto itself, and indeed requires that a data warehouse already exists in order to function.

While AS uses DSO to communicate with its own management interface, it uses Data Transformation Services (DTS) to communicate with other operations-based applications. These can then be configured to continually feed an AS data cube. Basically, DTS is what processes AS—updating the relational database with new data and feeding that information to the OLAP cube.

Under AS, such a cube is a very specific logical construction, allowing the developer or the user to access the data warehouse in three-dimensional chunks but with the added benefit that an AS cube acts as though it contains every detail value from its source fact table. Actually, however, it can dynamically update this data via DTS. You can even build virtual cubes that combine data from multiple underlying cubes.

In effect, Microsoft has extended AS (whose previous iteration was dubbed OLAP Services) to include not only OLAP functionality but data mining tools as well. And the really big surprise is that while Redmond does bundle AS with SQL Server 2000, a Microsoft database is not a requirement. You can use AS with any relational database, even Access.

When you ask Microsoft what makes SQL Server 2000 a sweet platform, it always seems to come back to those TPC scores of a few months back. I've always considered those numbers to be about as valuable as Ziff-Davis' vaunted Windows graphic benchmarks of the mid-1990s. Real performance numbers are application-based, and we can argue SQL Server 2000's prowess back and forth in that department. What sets this product apart is a comparatively affordable price tag attached to powerful, state-of-the-art tools that aren't restricted to Redmond software. ∎

Oliver Rist is vice president of product development for rCASH in the REALM. Reach him at orist@therealm.com.

THE TWO DISASTERS THAT WEREN'T

THE END OF CIVILIZATION

As I take quill to tree bark to reflect on the year past, it seems hard to remember a time of civilization…oh, wait a second. That Y2K thing? Where rollover issues were going to "conservatively" cause $300 billion in damage, have a 15 percent chance of causing a worldwide economic depression and perhaps permanently destroy the power grid? Wrong!

I suggest that it's time to look at the Y2K fiasco as an object lesson for the software industry. A 1997 article I wrote for Software Development Magazine titled "The Y2K Pork Parade" pointed out that every software developer knew the central premise of Y2K hysteria—that computers represent dates as two-digit decimals—to be almost certainly false for any software written in the past 20 years. And when it wasn't false, it was mainly irrelevant.

I also described something that was much less apparent, which was that the $300 billion to $600 billion damage estimate that was commonly cited was derived from a *single* analyst's report data model, a mode that was laughable under scrutiny. There was only *one* report published that used accepted estimation techniques, and it placed the worldwide cost of Y2K at $20 billion to $60 billion. (Y2K preventive spending was in the neighborhood of $25 billion, with the U.S. federal government being the largest spender.)

Y2K was the biggest story in software history, and we in the software development technical press did a disservice by not injecting rationality into the discussion. True, I haven't heard of a single colleague contacted by the mass media to comment on Y2K, but we should have been more proactive in giving the mass media some zingy headlines and sound bites. The software development industry is going to be the backbone of the economy for the next hundred years, and we must complain with loud voices when the mass media misrepresents what we know to be true with ridiculous phrases like…

THE DEATH OF THE DOT-COM ECONOMY

There is a sudden flurry of advertisements that feature a honey-throated man's voice snootily commenting on the foolishness of those who dared start businesses in the past five years and have seen paper fortunes come and go. Now that this nonsense is over with, say these commercials, you can check with us and we'll give you what you need to make a profit—the right hardware, the proper software or the appropriate team of consultants.

What the commercials conveniently ignore is that the rise and fall of dot-com stock prices was a reflection of market

WEB WATCH

LARRY O'BRIEN

sentiment, not technical underpinnings. And that when it comes to technical underpinnings, the surest route to failure is to burn your funding by paying exorbitant fees to external service providers.

In 1994, my business developed a Web site for a programmers' conference. It had about five pages that described the conference, the complete course catalog and a registration program that allowed you to select classes, print your calendar and pay for tuition. My wife did the graphics and I did the programming, and we charged around $10,000 for a couple of weeks' work. The site was profitable in a time when 14.4Kbps modems were the preferred way to connect to the Internet.

Today, a Web shop might charge in excess of $100,000 for that application. It would take six months or more to move from concept to reality, and would almost certainly generate less than $100,000 worth of revenue. A profitable 1994 business plan wouldn't be profitable today.

Yes, business basics apply to the Web, and minimizing the cost of goods sold is far more fundamental than benefiting from a consulting firm whose Web experience, like everyone's, is at best only a few years old. The path to profitability starts with two low-cost acronyms: MSDN or LAMP.

For $2,500, a Microsoft Developer's Network Universal subscription gives you

the keys to Microsoft's kingdom, while a speedy Internet connection can set you up with Linux, Apache, MySQL and Python. (Okay, I just said that last to tick off the Perl hackers!) Once you're under way, you can see if you need Sun servers, Oracle databases and $50,000 app servers. Maybe you do, as those vendors have great benefits for you to weigh against their purchase or license costs, but there's no reason for seed-stage startups to spend hundreds of thousands of dollars on software and consulting.

As for the whipsawed fortunes of unviable companies going public, trading at stratospheric heights and then going into devaluation death spirals—that's how the market works! Whether rational belief or irrational exuberance, the *market* decided on those billion-dollar valuations before pulling the rug out.

2001 is going to have more ugly economic news, as dot-leveraged companies and individuals find themselves unable to keep the creditors at bay. This will ultimately be good news for competent software developers, who will find themselves the beneficiaries of the flight to quality on the part of companies retooling themselves for the real beginning of the New Economy. ∎

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A ROAD LESS TRAVELED

INTERNAL MEMO
TO: Accounts Payable Dept.
RE: Denied expenses
Gentlemen:

I received this morning, via interoffice mail, a bundle of reimbursement requests I have submitted for expenses over the past few weeks, along with your memo denying reimbursement for selected items.

Since you asked, I do understand the importance of adhering to company policy and I do appreciate the need for fiscal responsibility. However, I believe my expense reports would have been approved if you had acquired sufficient knowledge of certain extenuating circumstances.

For example, you denied reimbursement for the 1965 Ford Thunderbird I purchased in Las Vegas when I was there on an *approved* business trip to Comdex and Linux Business Expo. It was necessary that I attend a late-afternoon panel discussion on the use of Linux in enterprise computing, and I missed my flight home. As you know, the airlines assess a hefty reticketing fee, so instead I got a bargain on a vintage T-bird and simply drove home. All I'm asking for is reimbursement for 15 cents per mile, as policy allows, and for the car, which I will continue to use when I attend future conferences.

Further, I disagree with your characterization of my wine purchases as

"expense report padding." The massages you queried are the result of very specific directions from my physician. And for your information, I do have a compelling business reason for scheduling a layover in Honolulu during a recent trip.

I also object strongly to your disallowance of reimbursement for Lego Mindstorms robot kits.

You may not know it in the accounting department, but Lego Mindstorms have taken the nerd world by storm. Lego introduced the inexpensive, flexible robots a couple of years ago for kids, but within a few weeks hackers had thoroughly reverse-engineered them. Schematics were posted on Web sites and open-source development tools began to appear.

Lego executives had a decision to make: They could protect their intellectual property by prosecuting the hackers or ignore the hackers and hope for the best.

They did neither. Lego surprised everyone by embracing the hacker community, opening up the product spec, and providing support for open-source programmers who sought to explore and extend the Mindstorms product. They modified the product to make it easier to program. They published advanced programmers' kits and documentation free of charge over the Internet.

OPEN SOURCE

J.D. HILDEBRAND

The result? A bustling community has grown up around Mindstorms. Open-source development systems based on C, Java and Forth have appeared. Programmers share expertise and source code on dozens of news servers and Web-based community sites, including sample code in C++, Perl, Tcl, Visual Basic, Delphi and Scheme. One enterprising group of programmers has even developed an open-source operating system for the robots, allowing developers to control the devices in arbitrary and complex ways. Books for Mindstorms programmers are hot sellers at Amazon.

The growth of this community appears to have taken a grateful Lego Co. by surprise. But the company has always taken robotics seriously. In fact, the concept for the Mindstorms kit was first articulated by AI expert Seymour Papert, for whom Lego endowed a professorship in learning research at MIT, and current MIT Lego professor Mitchel Resnick. The company has established robotics learning centers in the U.S., the U.K., Denmark, Norway and Singapore.

The Mindstorms product has been a retail hit too, helping to propel Lego to 10 billion deutsche marks in 1999 revenues and profits of 500 million marks.

The lesson? Lego would have been well within its rights—and would have satisfied all traditional thinking about intellectual property—if it had locked

out the hackers, kept its APIs private and insisted that Mindstorms robots could be programmed only with Lego tools. That's what 99 out of 100 companies would do.

But Lego took a less-traveled road. Somewhere high in the executive towers somebody had a thought: What if we took the open-source route and gave away information to make our product more interesting, useful and entertaining? What, precisely, do we have to lose?

You can bet the attorneys argued against it. But creative thinking prevailed. And Lego is reaping the benefits. It's a lesson for all of us.

That's why it was necessary to order a Lego Mindstorms robotic kit. I'm studying an emerging business dynamic of the open-source age. It's essential that we understand this project and how we might empower our customers by opening up our own products. Could we benefit from the Mindstorms phenomenon? Will our sales skyrocket if we give away source code and technical specs?

As for the second Mindstorms kit, the one I ordered for my nephew…well, he's been doing a little consulting for me. Yes, he's only 10, but he's doing great work for us. It's a business expense, honest. ∎

J.D. Hildebrand is the former editor of such publications as Computer Language, Unix Review and Windows Tech Journal. Reach him at jdh@sdtimes.com.

News Briefs

MORE PRODUCTS

offer operating systems based on beta versions of the 2.4 kernel . . . Informix Software Corp. has optimized its **Informix Dynamic Server 2000** (IDS2000) for Itanium-based servers running the HP-UX operating system. Porting IDS2000, a data and content management Web platform, to HP-UX Itanium servers will increase performance, capacity and scalability for customers using both IDS2000 and HP-UX, the company claims . . . For companies trying to put existing applications on the Web, GraphOn Corp. has updated its Bridges software to **version 1.1. Bridges** to let standard applications running on HP-UX or Solaris servers run remotely over a LAN or the Web, with its user interface inside a client's Web browser. A version of Bridges is also available for both Red Hat Linux and Windows NT/2000 . . . AbriaSoft Co.'s new **Abria SQL Standard 2.1** for Red Hat Linux and Microsoft's Windows operating systems integrates a Secure Socket Layer flavor à la the Apache Web database server. The Windows version of Abria SQL Standard 2.1 also features Apache/SSL and ODBC connectivity. In addition, 2.1 features a 500-page book of MySQL and msql. Version 2.1 is available at an introductory price of $99 . . . ActiveState Tool Corp. and the XML Fund have partnered to develop **XSLT IDE**, an integrated development environment for Extensible Stylesheet Language Transformation (XSLT) for both Microsoft's Visual Studio.Net (7.0) and ActiveState's Mozilla-based IDE Komodo. XSLT IDE will be cross-platform to enable programmers to debug XSL transformations. In addition, ActiveState has released **Visual Perl** for Microsoft's Visual Studio.Net, providing a syntax-based colorized editor for instant feedback when writing code; code-completion assistance such as method tips and call tips; online documentation; and the ability to run programs in a debugger or a shell . . . Developers needing to integrate Web-enabled mailing labels, mail merges or list-based reporting into their databases can use Combit GmbH's updated **List & Label 7.0**. According to the company, the 32-bit Windows component can be integrated into all DLL-compatible languages such as Borland's Delphi or Microsoft's Visual Basic. It can also be deployed as an ActiveX component. The newest version supports double-byte languages and Unicode. The full developer's version, including an unlimited runtime license, costs $490; a Visual Basic-only or Delphi-only version costs $350.

PEOPLE

Application Technologies Inc. has appointed **Jean-Michel Texier** as vice president of technology solutions. He was formerly chief information officer with the World Wildlife Fund . . . . . . **Steven L. Chaput** has been named vice president of engineering at Geodesic Systems Inc. He will report directly to **Anthony Layzell**, company CEO . . . The Starbase Professional Services Group has installed **Karen Bennett** as vice president in charge of consulting, implementation and training services for the U.S. Formerly North American director of consulting at Merant Inc., she will report to **Jim Smith**, executive vice president of the Starbase Customer Group . . . **Steve Sakoman**, Be Inc.'s chief operating officer, has been appointed to its board of directors as it accepts the resignation of **Christian Marchandise** from the board to pursue his European business ventures. Sakoman is a co-founder of Be, after working at Apple Computer Inc., Hewlett-Packard Co. and Silicon Graphics Inc. . . . . Tibco Software Inc. has promoted **Frank Bergandi** to senior vice president of worldwide sales and field operations. Before joining Tibco in 1998, Bergandi was president and CEO of Objectivity Inc. . . . Ontos Inc. has elected **Philip W. Ness Jr.** as chief executive officer and Thomas J. McCoy and T. Mark Morley as co-chief operating officers . . . **Jerry Greenburg** is the new senior vice president of marketing at TurboLinux Inc. Greenberg was most recently the senior director of marketing at Fujitsu's HAL Computer Systems subsidiary . . . **William F. "Mike" Denman Jr.** has joined MicroEdge Inc. as president after a stint as studio head at Hasbro Interactive, where he developed gaming projects. **Jill L. Maurer** still maintains the chairman and CEO positions. ∎

SAKOMAN

XKMS

Warwick Ford, VeriSign's chief technology officer.

Helping VeriSign move the ball down the field are Microsoft Corp. and WebMethods Inc. Jeremy Epstein, WebMethods' security architect, noted that with several enterprises using different flavors of PKI, interoperability among PKI vendors is difficult to achieve due to imprecise interface standards. A comprehensive knowledge required of each PKI vendor's products further thwarted interface development, he said.

Ford said that XKMS provides a new interface that enables an application to execute one or two simple transactions back to where key management services reside, such as PKI servers provided by security vendors. "With the XKMS specification, application vendors will now be able to off-load onto service providers the complex coding and programming necessary for including digital signatures into documents," Ford said.

Subsequently, applications will not require developers to create the code for such functions as digital certificate processing and revocation-status checking, he said. These functions will reside at the service-provider level, effectively retiring many PKI development kits.

Commenting that the new specification appears to be a reasonable attempt to make PKI work more smoothly, Rik Farrow, an independent security consultant, pointed out that Microsoft,

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X.509/PKIX PKI Model

The present, bulky PKI model features several layers, all requiring coding.

VeriSign and WebMethods are releasing the XKMS specification to the W3C only after they have already worked it out among themselves, which is "not the standard way to attempt to create a standard." He suggested, in fact, that the three vendors may have positioned themselves to have an edge in the market with this technology.

In development for nearly nine months by those three companies, with VeriSign taking the lead, the XKMS specification is the anchor for a VeriSign suite called Trust Services, available at www.verisign.com, which also includes the Security Services Markup Language (S2ML) specification, XML Pay and the Extensible Provisioning Protocol (EPP). XML Pay, for example, provides financial networks with payment requests and responses to debit cards, purchase cards and Automated Clearinghouse, or ACH, payments. EPP is an

XML-based domain name management facility for selling domain names, telephone numbers and identity assets. S2ML, on the other hand, is similar to the recent AuthXML authorization specification spearheaded by Securant Technologies Inc., which is headed to either W3C or OASIS for recommendation.

Indeed, XKMS, S2ML and AuthXML are designed to complement one another, said WebMethods' Epstein. He said that with AuthXML or S2ML sitting atop XKMS, "AuthXML and S2ML authenticate or authorize movement of digital signatures, and XKMS implements them."

Epstein said WebMethods helped review the XKMS specification to determine whether it met the needs of its customer base. Because XKMS uses the Simple Object Access Protocol (SOAP) for its message transport, "as users of certificate management services it was important to keep the transport open to address our needs," such as transporting other file formats and unstructured data, Epstein said. He added that in fact XKMS doesn't specify when SOAP is to be used.

What about Microsoft? David Turner, Microsoft's product manager for XML technologies, has said that XKMS would be built into the company's .NET architecture to provide trust services for XML applications. He said developers would be able to incorporate trust services from any vendor into products within days rather than weeks using the XKMS specification, because the interface would eliminate the need for toolkits to build the services.

RSA Security Inc. also announced it would incorporate the XKMS specification into its future products. ∎

ORACLE SHOWS NEW APPLICATION DEVELOPMENT, HOSTING SERVICES

BY ALAN ZEICHICK

Not content to merely sell databases, e-business suites and development tools, Oracle Corp. is expanding its business to include applications hosting—and is even revamping its developer-support program into a hosted development environment.

The company's first foray into application hosting came last fall, with the introduction of Oracle Sales Online. The next offerings are two hosted application services designed specifically for developers.

OracleMobile Online Studio is an online environment designed to let developers build, test and deploy hosted wireless applications using the Oracle8i database and Oracle9i app server.

In late December, Oracle also repositioned its Oracle Technology Network, a support service for developers, as Oracle Portal Online Studio, a hosted environment for building general applications on Oracle8i and Oracle9i. A special PDK (portal development kit) lets developers build and test what the company calls "portlets," which can then be deployed on Oracle's servers or downloaded and run on an enterprise's own Oracle8i and Oracle9i servers.

Both hosted development environments are paid services, with prices varying on corporate volume commitment levels. ∎

TAKEOVERS TAKE OVER

In March, Computer Associates acquired Sterling Software for $4 billion. It was the biggest acquisition, in terms of dollars, in industry history. A few weeks later, i2 Technologies purchased Aspect Development in a stock deal valued at $9.3 billion. It was a heady time of unprecedented valuations and huge caps, of corporate takeovers conceived at boardrooms on a par with that of the fictitious Engulf & Devour Corp. of Mel Brooks' imagination.

MONEY WATCH

DAVID RUBINSTEIN

Then came the correction. The Nasdaq composite index has lost 48 percent of its value from its high in March. Valuations nose-dived. Long-term investors began their obligatory hand wringing; others pulled out what was left of their money. Planned IPOs never got off the board. One of the hardest hit companies was the Canadian firm Corel, which was poised to acquire Inprise (nee Borland International, now Borland Software) in a deal planned to bring Linux onto the desktop and into the limelight. But the $2.44 billion deal unraveled when it was learned that Corel faced a huge cash crisis that threatened its very existence due to a precipitous drop in its stock price. Corel, after minor life-sustaining infusions of cash, was rescued by Sir Robin Hood of Redmond. Microsoft pumped $135 million into Corel to keep it alive, with the understanding that Corel would develop applications for Microsoft's .NET Framework and make its engineers available to work on a Microsoft version of Linux whenever Sir Robin sees fit.

Not all the business news in 2000 was as depressing as the Corel saga, as companies looked to leverage technologies they could not develop as quickly or as well themselves. Foremost in this group is WebGain, a company spun off from BEA Systems with an assist from Warburg Pincus. First, WebGain picked up VisualCafé from Symantec, then TopLink from Object People and DreamWeaver from Macromedia. Then after all of these pieces were rolled into the WebGain Studio development suite, WebGain acquired Zat, maker of the Spin rapid application development tool. Thus, a company was built, in the image of its onetime parent.

Meanwhile, BEA was practicing what it preached, acquiring Workflow Automation back in March. Workflow provided BEA with the technology to create collaboration and process integration tools within the WebLogic application server.

Bluestone Software, which went public in September 1999, acquired Arjuna Solutions of England for $13 million in July. Arjuna made a Java Message Service implementation to complement Bluestone's Total-e-Business application server. Who could know that a mere two months later, Bluestone would itself be swallowed up by Hewlett-Packard in a deal said to be worth $467.6 million? HP wanted Bluestone's Web-based technologies to become the platform for HP's software offerings.

Another Java application server vendor, Gemstone Systems, was swallowed whole by Brokat AG, which also acquired Blaze Software in a plan to broaden Brokat's Twister e-services platform.

On the embedded front, BSquare picked up Blue Water Systems for its Windows developer solutions, and spliced Mainbrace for $21 million to gain its solutions for mass-market devices. Wind River Systems, the RTOS giant, fueled its voracious appetite for acquisition with AudeSI Technologies (for 1.075 million shares of stock) and Embedded Support Tools (for $28.5 million). Linux vendor Caldera Systems acquired the software and professional services division of Santa Cruz Organization for $7 million and 17.5 million shares of Caldera stock.

Other recent acquisitions that would have gotten more ink if not for the upheaval then surrounding the presidential election include Sun's $400 million purchase of HighGround Systems, and Sun's acquisition with iPlanet of Grapevine. Also, Rational Software picked up the remaining share it did not already own of Catapulse in a deal said to be worth $405 million.

Will we see mergers and acquisitions continue this year at the rapid pace of the past several years? Well, last month Fed chairman Alan Greenspan said if the economy continues to slow too dramatically, the board would consider lowering interest rates.

Brrrrrrrng! And, they're off! ∎

David Rubinstein is executive editor of SD Times.

EVANS DATA WATCH

How Likely Are Developers to Write Applications for Linux Next Year?
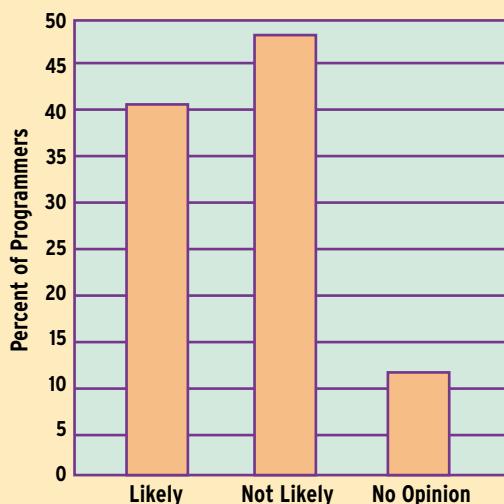
Showing that Linux is gaining in acceptance, more than 40 percent of developers surveyed said they are likely to write applications for Linux this year. Almost 48 percent, however, said they had no plans to write Linux applications this year.

Six hundred North American developers were surveyed in October 2000 for this information.

Copyright 2000, Evans Data Corp.

...more than 50,000 members

connections

...hundreds of deliverable templates and project plans

answers

...15,000 pieces of content

valuable insight

...james martin process library

experience

and **you**...

success!

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IT ISN'T THAT YOUR COMPANY DOESN'T KNOW **WHAT** IT'S DOING,
MERELY THAT IT DOESN'T KNOW **WHO** IS DOING IT.

You are in charge of a team. And the work your team does. Staying on budget is critical. Staying on schedule is critical. So, how do you make certain both of these things occur in every business process? Manage your workflow effectively with tTrack™ workflow solutions on the Web. With tTrack, everyone on your team shares the same information. So nothing is overlooked, and nothing falls through the cracks. Visit our Web site for in-depth details we wouldn't feel right squeezing in here.

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